RACELOGIC TRACTION CONTROL

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CONTENTS

1. FITTING INSTRUCTIONS 4

1.1 INTRODUCTION 4
1.2 INVENTORY OF THE TRACTION CONTROL KIT 4
1.3 RECOMMENDED FITTING TOOLS 5
1.4 INJECTOR CUT 7
1.4.1 General 7
1.4.2 Locating Signal Wires 7
1.4.3 Connecting The Injector Cut 8
1.4.4 Connectors 9
1.4.5 Grouped Injection 10
1.5 ABS CONNECTION 11
1.5.1 General 11
1.5.2 Locating Sensor Wires 12
1.5.3 Connecting Traction Control ABS Wires 13
1.6 MISCELLANEOUS CONNECTIONS 14
1.6.1 Ignition Switched Supply 14
1.6.2 Ground (GND) 14
1.6.3 RPM 15
1.7 FITTING THE TRACTION CONTROL SWITCH 16
1.8 CALIBRATION AND TEST PROCEDURE 17
1.8.1 General 17
1.8.2 Traction Control Checklist 17
1.8.3 Wheel Speed Calibration 18
1.8.4 Calibration Procedure 18
1.8.5 Final Test 19
1.8.6 Common Problems and Solutions 19
1.9 TRACTION CONTROL SWITCH/ADJUSTER 21
1.9.1 Traction control settings 21
1.9.2 Diagnostic Modes 22
1.10 LAUNCH CONTROL 23
1.10.1 General 23
1.10.2 Adjuster Program 23
1.10.3 Laptop Program 24
1.10.4 Launch Procedure 24
1.11 CARS WITH ONLY 3 WHEEL SPEED SENSORS 25
1.11.1 Procedure for configuring cars with 3 wheel speed sensors 25
1.12 8 CYLINDER TRACTION CONTROL 27
1.13 CONNECTOR WIRING 28
**- Only on TC8 ..... 28*

2. SOFTWARE 29

2.1 INSTALLATION 29
2.2 CONNECTING THE TRACTION CONTROL TO THE COMPUTER 29
2.3 TRANSFERRING SETTINGS FROM THE TRACTION CONTROL 29
2.4 TRANSFERRING SETTINGS TO THE TRACTION CONTROL 29
2.5 MAIN WINDOW 31
2.5.1 File menu 31
2.5.2 Options Menu 32
2.5.3 View menu 34
2.5.4 Help menu 34
2.6 GRAPH WINDOW 36
2.6.1 File menu 36

2.6.2 Options menu 37
2.6.3 Colours menu 37
2.6.4 View 38
2.7 GRAPH FUNCTIONS 38
2.7.1 Zoom 38
2.7.2 Pan 39
2.7.3 Cursor 39
2.7.4 Show / Hide data 40
3. TRACTION CONTROL SETTINGS 40
3.1 CONFIGURATION 40
3.2 LAUNCH CONTROL 45
3.4 WHEELS 48
3.5 REV LIMITS 51
3.6 DATA LOGGING (ONLY FOR UNITS WITH BATTERY BACKUP MEMORY) 52
3.7 REAL TIME 53
3.8 TEST 54
4. FINE TUNING 55
5. SELF-FIT SENSORS 57
5.1 SENSOR 57
5.2 PICKUP METHODS 57
5.3 SENSOR FITTING 58
5.4 SENSOR GAPPING 59
5.5 SENSOR CHECKLIST 59
5.6 RUNNING WHEEL SPEED WIRES 59
5.7 CONNECTING SENSORS 60
5.8 PROGRAMMING THE PPR (PULSES PER REVOLUTION) 60
5.9 TESTING 61
5.10 COMMON SENSOR PROBLEMS AND SOLUTIONS 63
6. CLUTCH SWITCH 64
6.1 FITTING A SWITCH 64
6.2 SETTING THE CLUTCH SWITCH REV LIMITS 65
6.3 TESTING THE CLUTCH SWITCH 65
7. MSD INTERFACE 66
7.1 CONNECTING THE MSD CUT 66
7.2 RPM 66
8. SPARK CUT 67
8.1 GENERAL 67
8.2 CONNECTING THE SPARK CUT 67
8.3 RPM 67

1. FITTING INSTRUCTIONS

Thank you for buying Racelogic Traction Control. By following the instructions in this manual, our system can be fitted to any car in a matter of hours. If you have any problems or queries while fitting the system, please call Racelogic on + 44 (0) 1280 823803 or Email traction@racelogic.co.uk.

1.1 Introduction

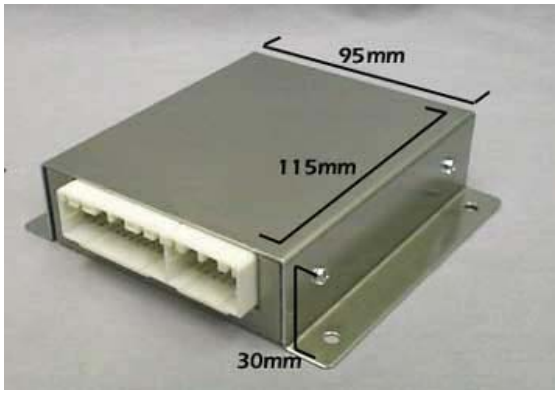
The Racelogic Traction Control System works by monitoring the vehicle's wheel speeds, constantly comparing the driven and undriven wheels, looking for differences between the two. When the system detects an excessive difference in wheel speeds above a programmable threshold a fuel cut is initiated to reduce the power of the engine, therefore reducing wheel spin.

Connecting the system involves interfacing with the vehicles existing ABS sensors to provide the wheel speed inputs and breaking each of the signal wires supplying the fuel injectors. This allows the Traction Control to cut fuel when wheel spin has been detected.

A Schematic of the complete Traction Control System can be seen in Diagram 1 on Page 6.

1.2 Inventory of the traction control kit

- Manual
- Software disc
- TC Box
- TC Loom
- Diagnostic Loom
- Diagnostic Plug
- TC Switch
- Heatshrink
- 2 x 8 Way Multilok Connector Male
- 2 x 8 Way Multilok Connector Female
- 18 x Male Contacts
- 18 x Female Contacts



Standard TC box.

1.3 Recommended Fitting Tools

- Screw Driver - Cross Head
- Screw Driver - Flat Blade
- Wire Cutters
- General Purpose Crimp Tool
- Wire Strippers
- Soldering Iron
- Solder
- Electrical Tape / Heatshrink Tubing (4/2 mm Shrink Ratio)
- Assorted Tyraps
- Multi-Meter

The tools listed above are the basic requirement for fitting Traction Control, additional tools may be required for specific vehicles.

Racelogic have fitted many cars with traction control and have an inventory of fitting instructions for specific cars. Please call or email us to see if we have your car listed.

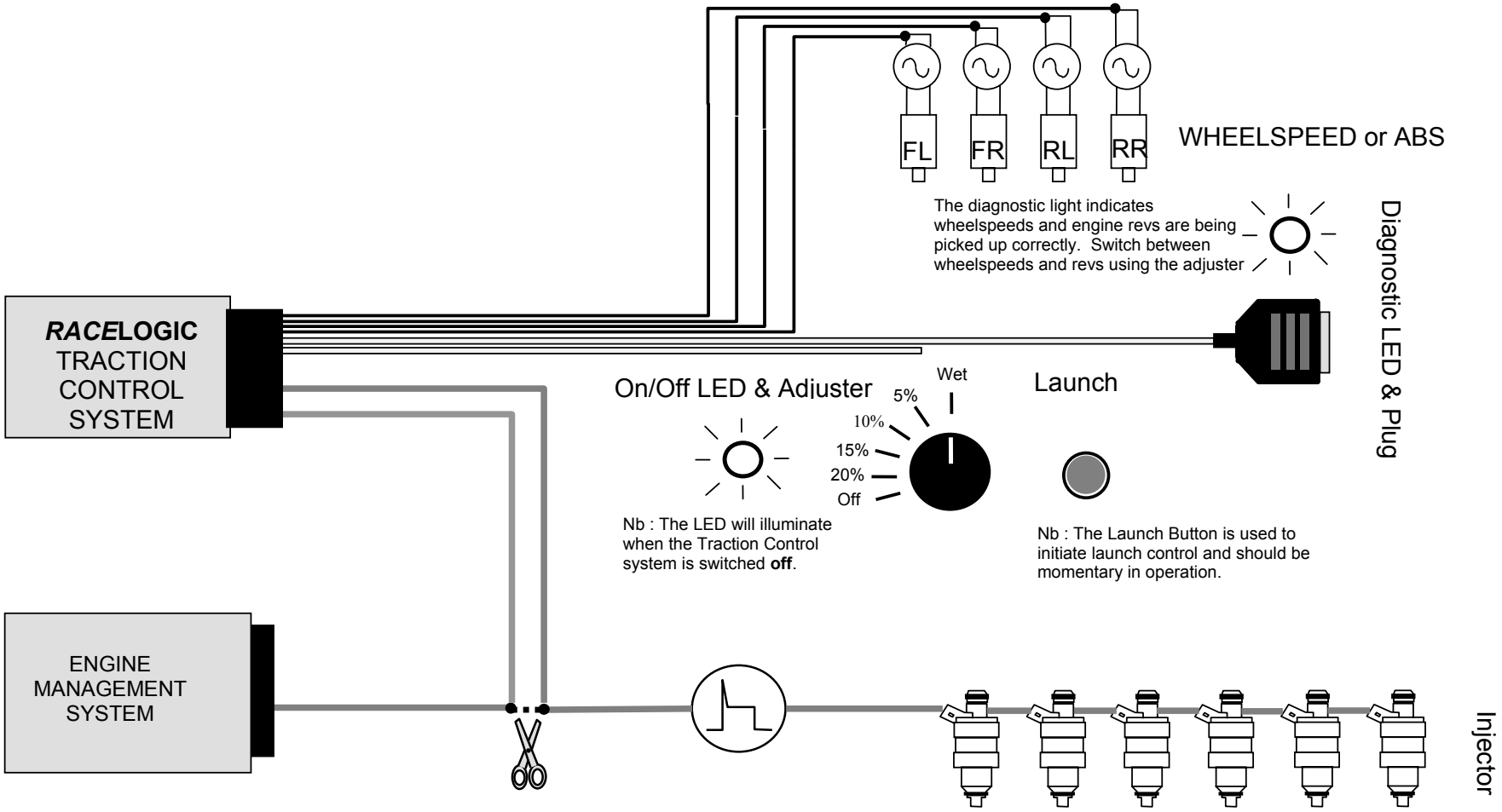

FL
FR
RL
RR
WHEELSPEED or ABS
The diagnostic light indicates wheelspeeds and engine revs are being picked up correctly. Switch between wheelspeeds and revs using the adjuster
Diagnostic LED & Plug
RACELOGIC TRACTION CONTROL SYSTEM
On/Off LED & Adjuster
Wet
5%
10%
15%
20%
Off
Launch
Nb : The LED will illuminate when the Traction Control system is switched **off**.
Nb : The Launch Button is used to initiate launch control and should be momentary in operation.
ENGINE MANAGEMENT SYSTEM
Injector

Diagram 1 Traction Control Schematic

1.4 Injector Cut

1.4.1 General

Injector cut works by taking the signal supplied to each fuel injector and feeding it into the Traction Control System. Under normal running the signal is exactly reproduced firing the fuel injectors as normal. When wheel spin is detected the traction control shuts down each fuel injector independently reducing the power of the engine progressively. The severity of the cut is dependent upon the amount of wheel spin detected and the parameters held within the Traction Control Unit.

By inspecting the fuel injectors of your vehicle you will see that two wires are connected to each one. One of the wires supplies +12 V where as the other supplies a 12V signal going down to GND to fire the injector. (see Diagram 2). It is these "signal" wires that have to be located and connected to the Traction Control.

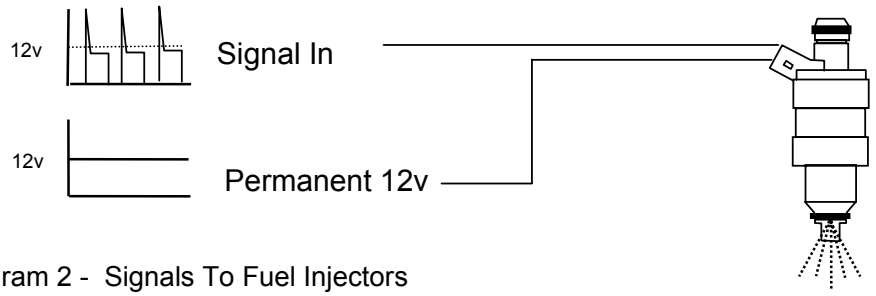


Diagram 2 - Signals To Fuel Injectors

1.4.2 Locating Signal Wires

The signal and 12V wires have to be connected to the correct pin of the fuel injector so you have to find the "polarity" of the fuel injection system before fitment. The polarity can be identified using a number of methods.

- Wiring Diagrams - If you have a wiring diagram of the vehicle trace each of the signal wires from the engine control unit (ECU) to each of the fuel injectors, the wiring diagram will normally indicate colour codes. The 12V feed wires will be linked together and will generally have a common colour code. If you have books such as the "Autodata - Fuel Injection" series these can help in identifying the polarity of a vehicles fuel injection system.

- Colour Coding - If you have no wiring diagrams you can identify the polarity by looking at the wiring to the fuel injectors. If each of the fuel injectors is fed by a common wire of one colour this will be the 12V feed, the remaining wires should all be different colours and will be the signal wires.

- Continuity Testing – On the majority of cars the 12V side of the fuel injectors are linked together. Place the multi-meter on one injector and check with the next injector, if one side continuity beeps back check the rest of the injectors.

Having located the signal wires, enter the colour codings for the fuel injection system in the table below.

Fuel Injector Signal and 12V Inputs			
Fuel Injector Number	**ECU Pin Number**	**Signal Input (Colour)**	**12Volts (Colour)**
1			
2			
3			
4			
5			
6			

1.4.3 Connecting The Injector Cut

Once the polarity of the fuel injection system has been found the signal wires feeding each fuel injector must be cut and the injector cut loom connected, Diagram 3.

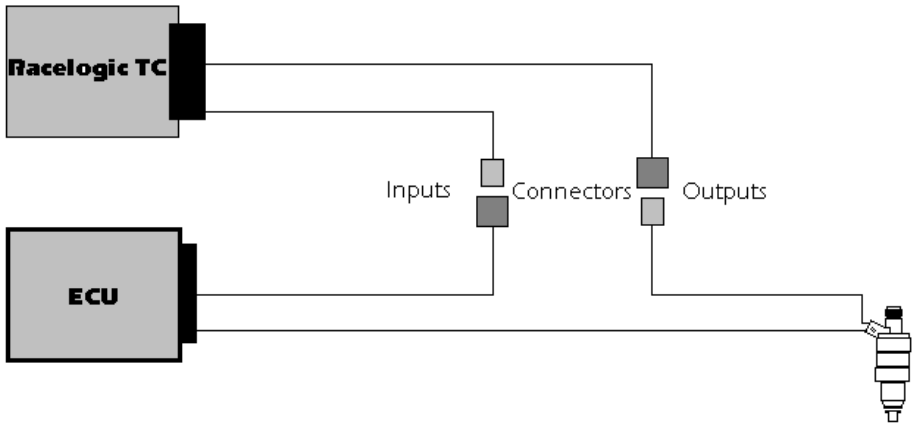


Diagram 3 - Injector Cut Fitting

1.4.4 Connectors

We highly recommend using the 8 way multilok connectors when interfacing the traction control with the vehicle, by doing this the car can be easily returned to standard.

Connect each wire from the Traction Control Loom to each of the injector signal wires as shown below

- Cut the signal wire and strip each end exposing the cores.
- Crimp a male contact to the ECU side and a female contact to the Injector side.
- Insert into the appropriate 8 way multilok connector making sure that when the connectors are placed together, the connection is remade.
- Repeat the above process for each of the signal wires.

The injector cut inputs and outputs wires have the following colours.

Traction Control Inputs and Outputs (4 Cylinder)			
Input Pin No	**Signal Input (Colour)**	**Output Pin No**	**Signal Output (Colour)**
8	Red	11	Red/Black
9	Orange	12	Orange/Black
22	Grey	25	Grey/Black
23	Green	24	Green/Black
Additional Inputs/Outputs (6 Cylinder)			
10	Yellow	13	Yellow/Black
21	Pink	26	Pink/Black

For example channel 1 of the traction control should be connected as in Diagram 4.

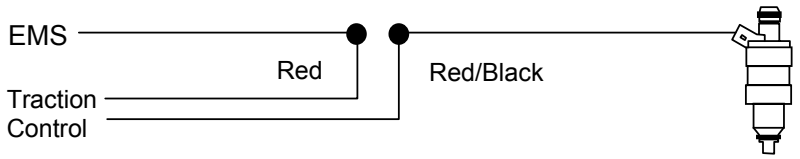


Diagram 4 – Example Connection

1.4.5 Grouped Injection

Grouped injection is when all the injectors are fired at once.

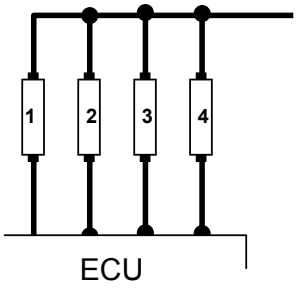


Diagram 5

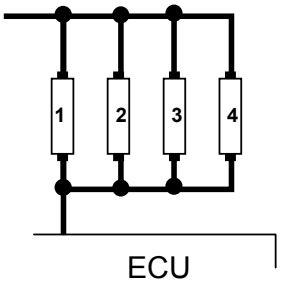


Diagram 6

Diagram 5 shows fuel injectors that fire sequentially. This means that the ECU fires each injector individually. The traction control can be interfaced at the ECU.

Diagram 6 shows that all four of the fuel injectors are fired off one signal from the ECU. This is more common in older cars. The traction control needs to be able to control individual injectors, so it will need to be interfaced where the signal splits to each injector. The signal is sometimes split just outside the ECU or at the injector under the bonnet, in which case extra wiring may be needed.

1.5 ABS Connection

1.5.1 General

The easiest method of linking into the ABS sensors is to locate the controller. This may look like an engine ECU or be combined with the ABS pump.

ABS Pump and Controller

ABS Unit

Most ABS sensors are passive inductive sensors that give a signal when metal passes near them. Resistance of sensors varies from 800 - 1200 ohms. Sensors usually have two wires each, which account for eight wires feeding the ABS unit. These wires have to be located and four wires from the traction control have to be connected to one side of each sensor. Deciding which wire to connect to is dependent upon the type of sensor used, Diagram 7.

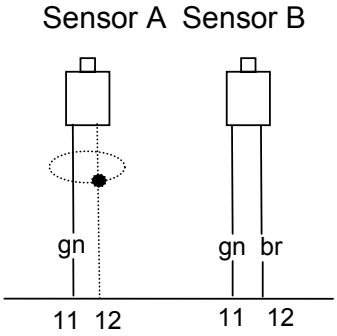


Diagram 7 - ABS Sensors

In the first example sensor A, one of the wires is connected to the shielding of the cable (pin 12), the traction control wire must be connected to the wire connected into pin 11. In the second example sensor B, both wires carry signals to the ABS, therefore the traction control can be connected to either wire.

1.5.2 Locating Sensor Wires

The wires can be found using a number of methods.

- Twisted Pairs and 2 core wire – The sensor wires will be fed back to the controller and are normally then identified as a twisted pair or 2 core cable.

- Wiring Diagrams - If you have a wiring diagram of the vehicle, trace each of the sensor wires to the ABS unit, the wiring diagram will normally indicate colour codes. If you have books such as the "Autodata - Anti Lock Braking Systems" series these can help in identifying the wiring. (Contact Racelogic if you do not have one).

- Multimeter Resistance Setting – Switch a meter to "Resistance" and test each of the wires leading to the ABS unit, Diagram 8. Ensure the connector is plugged in when you are doing this. Wheel speed sensors will generally have a resistance of between 800 – 1.2 K ohms.

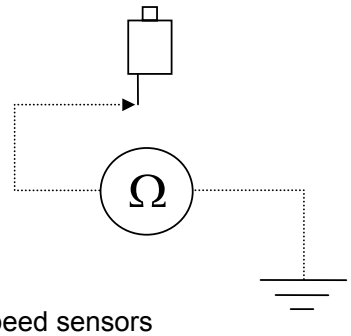


Diagram 8 Testing for wheel speed sensors

Having completed the test, write down the wiring colours corresponding to each wheel speed in the table below.

ABS Wheel Speed Inputs	
ABS Wire (Pin No)	ABS Wire (Colour)

1.5.3 Connecting Traction Control ABS Wires

The 4 traction control ABS wires are coloured Red, Blue, Yellow and Green and form the 4 core shielded cable.

Connect each wire from the traction control loom to each of the 4 ABS sensor wires as follows.

- Strip back the shielding of the ABS wire exposing the cores.
- Tin the cores using the soldering iron and solder.
- Strip back the shielding of the traction control wire.
- Tin the cores using the soldering iron and solder.
- Solder the traction control Wire to the ABS wire.
- Cover the joint with insulation tape.

The ABS connections can be tested using either a laptop computer or the diagnostic facility on the traction control.

1.6 Miscellaneous Connections

1.6.1 Ignition Switched Supply

The red wire (Pin 2) with inline fuse should be connected to a suitable ignition switched 12V source. A suitable 12V source can be found using any of the following techniques.

- Wiring Diagrams - If you have a wiring diagram of the vehicle, find an ignition switched 12 V feed.

- Multimeter – Select "voltage test" on the meter and probe wires that could supply an ignition feed 12V. Once a suitable feed has been found, crank the car and ensure it doesn't go to GND during cranking.

- Injectors – Trace the 12V side of the fuel Injectors back to either the relay box or the ECU.

Once a suitable feed has been found, follow the procedure below for connecting the 12V supply to the 12V input of the traction control.

- Strip back the insulation of the 12V wire exposing the cores.
- Tin the cores using the soldering iron and solder.
- Strip back the insulation of the traction control wire.
- Tin the cores using the soldering iron and solder.
- Solder the traction control Wire to the 12V wire.
- Cover the joint with insulation tape.

1.6.2 Ground (GND)

The double black wire with a ring terminal (Pin 1,14) should be connected to a solid GND, ***if at all possible it should be bolted to the chassis***. If you cannot bolt it to the chassis, make sure it is connected to a wire that is thicker than the combination of the two twisted wires. A suitable GND can be found using any of the following techniques.

- Wiring Diagrams - If you have a wiring diagram of the vehicle find a main GND wire.

- Multimeter – Select "Continuity Test" on the meter and hold one probe on a known Ground e.g. Battery GND, hold the other probe on the test wire. If the meter gives an audible tone the test wire is a suitable point to GND the wire.

1.6.3 RPM

The Black/White wire (Pin 18) should be connected to a suitable RPM signal. A suitable signal would be either 0 –12 Volts or 0 – 5 Volts .

A suitable RPM signal can be found using any of the following techniques.

- Wiring diagrams - If you have a wiring diagram of the vehicle find an RPM signal.
- Tachometer – There is usually an RPM signal leading to the back of the dashboard. **(Highly Recommended)**
- Coil signal – note, if the car has twin coils the cylinder value in the traction control menu may need to be changed. e.g. 6 Cylinder engine, twin coils, set cylinders to 3 if RPM is picked up off one coil.
- Diagnostic Connector – Some cars have a diagnostic connector, these will normally have a RPM signal. e.g. pin1 on BMW Diagnostic Socket.
- ECU – most cars will have an RPM signal going into the ECU.

Once a suitable RPM signal has been found, follow the procedure below for connecting the RPM wire to the RPM input of the traction control.

- Strip back the insulation of the RPM wire exposing the cores.
- Tin the cores using the soldering iron and solder.
- Strip back the insulation of the traction control wire.
- Tin the cores using the soldering iron and solder.
- Solder the traction control Wire to the RPM wire.
- Cover the joint with insulation tape.

The RPM connection can be tested using either a laptop computer or the diagnostic facility on the traction control. This is explained in Section 7.2 Diagnostic Modes.

1.7 Fitting the traction control switch

The traction control switch will need to be mounted on the car where the driver can adjust it while driving. The launch button can be fitted away from the switch by extending the two grey wires. When installed, the switch will need to be connected to the switch wire on the traction control loom. Connect the switch to the loom colour for colour, making sure the connections are covered with the heatshrink provided.

The adjuster connects to a three core cable from the main traction loom. This cable consists of a red, a green and a blue wire.

Manual Slip Adjuster installed in a Holden HSV

Launch Button and Manual Slip Adjuster installed in a Nissan 300ZX

1.8 Calibration and Test Procedure

1.8.1 General

Once the Traction Control loom has been connected, the system is ready for calibration and testing. The system will need calibrating before it will work properly and is initiated by plugging the calibration adapter into the diagnostic lead.

The traction control system is also fitted with self-diagnostics. This enables engine RPM and 4 wheel speeds to be indicated via an LED on the diagnostic lead. Diagnostic mode is accessed at any time by selecting the desired wheel speed channel or RPM using the rotary adjuster.

Please check the items on the checklist below are correct before calibrating the system. The checks are in normal type and the tests are in italics.

1.8.2 Traction Control Checklist

Yes

1. Has the 12 Volts supply been connected to the Red Wire (Pin 2) of the Traction Control. ☐

2. Has the black GND wire (Pin 1) been connected to a suitable GND. ☐

   Complete checks 1 and 2 and Turn the ignition switch on. Check if the diagnostic light illuminates for 2 seconds, the switch will light up if in the off position.

3. Have all the injector wires been cut and spliced into the traction control wiring loom. Inputs to the ECU side and outputs to the fuel injector side. ☐

   Start the car and ensure it runs without misfiring.

4. Has the black/white RPM wire (Pin 18) been connected to a suitable 0 – 5 or 0-12 Volt signal. ☐

   Switch the adjuster to the off position. Start the car and Rev, ensuring the diagnostic light flashes in time.

5. Have all the ABS wires been connected to each Traction Control wheel speed input. ☐

   Select 15%, 10%, 5% and Wet on the adjuster which will indicate wheel speeds 1 through to 4 on the LED. The light must have started flashing above 20 kmh.

If all the answers to the checklist above are yes please proceed to the next section.

If there are any queries please call Racelogic's technical helpline on
+ 44 (0) 1280 823803 or email traction@racelogic.co.uk.

1.8.3 Wheel Speed Calibration

Before the Traction Control system will work the wheel speeds have to be configured to tell the system which are driven and which are reference wheels. To configure the wheel speeds follow the procedure below.

Start the car.
Take the car to a section of road with a short straight followed by a slow 180 degree corner, left or right, Diagram 9.

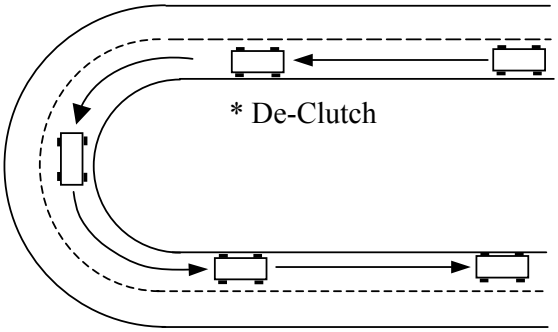


Diagram 9 – Corner Suitable For Calibration.

1.8.4 Calibration Procedure

1. Drive the car to a suitable test road, preferably where almost full lock can be used.
2. Switch the engine off and wait for the system to power down (If in doubt turn the adjuster to the off position and wait for the light to go off).
3. Plug the calibration adapter into the diagnostic lead.
4. Turn the ignition switch to the **on** position.
5. After 2-10 seconds the LED will start flashing (Once every second) to indicate the system is in calibration mode.
6. Start the car.
7. Drive the car towards the corner, and turn the corner
8. Once the system is calibrated the light will stop flashing once a second and will flash in time with RPM or any of the four wheel speeds, depending upon the switch position.

1.8.5 Final Test

Jack the driven wheels of the car and start the engine. Engage a gear and spin the wheels. When the wheels are spun above 14 km/h does the engine misfire?

Yes - The system is working correctly and the fitting procedure is finished.

No – Check that the RPM source has been connected and is being supplied by a valid signal by repeating section 5.3.

1.8.6 Common Problems and Solutions

Q - The car will not start

A - Check the fuse – 5A

A - Check the 12V supply to the system. Is it ignition switched? and ensure the signal does not go to GND during cranking.

A - Check the GND to the system, the grounding point should be a chassis ground preferably with other wires grounded through the same point. If in doubt, check continuity to a known GND such as battery GND.

A - Check the inputs and outputs of the traction control are wired into the fuel injectors correctly; i.e. The wires with no trace are connected to the ECU and the wires with traces are connected to the fuel injectors.

Q – The car starts but misfires

A - Switch the adjuster to the off position and see if the misfire persists.

If the misfire stops :
Try to distinguish if the car is misfiring or if it is hitting a rev-limit, if it is hitting a rev-limit Launch control may be active.

If the misfire is more random the problem may be caused by rogue signals on the wheel speeds eg Electrical noise. Ensure all wheel speed wires are run away from all the vehicles HT circuit.

If the misfire persists: Check the inputs and outputs of the traction control are wired into the fuel injectors correctly.

Q – The car runs cleanly when stationary but misfires when driving.

A – Does the car only misfire at low speed ?

Yes - Use the diagnostic light or laptop to ensure all the wheel speeds are being indicated and are picking up at roughly the same speed.

If all of the wheel speeds are not being picked up until higher speeds, connect each of the wheel speed pickup wires to the other side of the ABS sensor wires.

If for example two wheel speeds come in early and two come in late use the table below to find out which wire colours correspond to which adjuster position and swap those wires.

Q – The car misfires throughout the whole rev-range.

A - Use the diagnostic light to ensure the traction control is picking up all four wheel speeds and engine revs. If any of the wheel speeds are missing, the adjuster position relates to each of the following wire colours.

Adjuster Position	Description	Traction control Wire Colour
Wet	Wheel speed 1	Red
5%	Wheel speed 2	Blue
10%	Wheel speed 3	Yellow
15%	Wheel speed 4	Green
20%	RPM	White/Black
Off	RPM	White/Black

If the misfire persists:

A - Reconnect the car to standard with the two 8 way multilok connectors and see if the misfire clears.

Q – The system is not picking up any wheel speeds.

A – Check the wires are connected to the ABS sensors.

A - Connect each of the wheel speed pickup wires to the other side of the ABS sensor wires.

1.9 Traction Control Switch/Adjuster

The interface with the traction control system is via the rotary switch that allows the system to be switched on/off and the amount of wheel spin to be adjusted.

Turn the knob fully anti-clockwise and the LED will illuminate indicating the system is switched **OFF**. One click clockwise and the system will allow 20% wheel spin before the first level cut is initiated. Each subsequent position will remove 5% increments from this value, until the most safe "Wet" mode is entered, shown in Diagram 10.

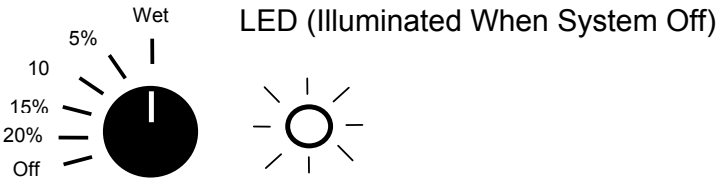


Diagram 10 – Traction control switch/adjuster

1.9.1 Traction control settings

Wet	-	For severe slippery conditions e.g ice, torrential rain
5%	-	Damp conditions
10%	-	Dry conditions
15%	-	Sport
20%	-	Sport
OFF	-	Traction control Turned Off, the car will function as standard.

The setting on the adjuster is down to the driving style of the driver and the grip available from the car. We suggest that when the system is first installed the driver experiments with the settings to find what setting suits best.

1.9.2 Diagnostic Modes

The Diagnostic modes can only be used once the adjuster has been connected. The diagnostic functions will not operate if the 'enable data logging' function is enabled.

The adjuster can also be used to switch between diagnostic modes. The LED connected to the diagnostic wire acts as a diagnostic tool which can display each of the 4 wheel speeds and the engine RPM.

Adjuster Position	Description	Traction control wire colour
Wet	Wheel speed 1	Red
5%	Wheel speed 2	Blue
10%	Wheel speed 3	Yellow
15%	Wheel speed 4	Green
20%	RPM	White/Black
Off	RPM	White/Black

When any of the wheel speed modes are selected, the light will be constant when the car is stationary. When the car is driven, the faster the car goes the higher the frequency the led will flash.

For example, if the adjuster is set to 10% and the diagnostic light does not flash, swap the yellow wire to the other side of the ABS sensor, to see if this cures the problem.

To test if the RPM wire is connected to a valid RPM source the adjuster will need to be switched to Off or to 20%. By revving the car the frequency of the led should increase.

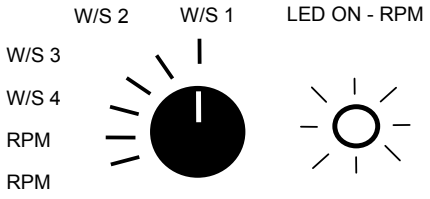


Diagram 11 – Adjuster positions for traction control diagnostics

NOTE – On the TC8 with Data logging, the logging must be turned OFF for the Diagnostic mode to work. It can be turned ON once the system has been setup.

1.10 Launch Control

1.10.1 General

Launch Control is a method of controlling the revs at the start. It is activated by the launch control button. This allows full throttle to be used, and the revs are controlled by the traction control. This means you only have to balance one foot instead of two. The system uses a secondary rev limit that removes itself automatically when the rear wheels are within a set percentage slip of the front wheels.

The Launch Control rev-limits can be programmed using two methods depending upon whether you have access to a laptop computer.

The Launch Control has two different rev-limits that can be set, WET and DRY. The wet rev-limit only works when the switch is positioned in the WET position. All other settings on the switch use the DRY launch.

1.10.2 Adjuster Program

The Launch control rev-limits can be programmed using the launch button supplied as part of the Traction Control Switch. Follow the procedure below to program in Wet or Dry rev-limits.

- Turn the vehicles **ignition OFF**.
- Turn the adjuster to **wet or dry** settings depending upon which rev-limit you wish to program.
- Turn the vehicles **ignition ON** and start the vehicle.
- Press the launch button once.
- Press the launch button again and hold down the launch button.
- Rev the engine to the desired Launch rev-limit.
- Release the launch button.
- The rev-limit will be set.

NOTE - When using the launch button to calibrate, the soft cut is set when the button is released, and the hard cut 250 RPM higher.

e.g. – To set the wet rev-limit to 4000 RPM.

Start the car.
Switch to wet settings.
Press the launch button twice and hold down on the second press.
Rev to 3750 RPM.
Release the button.
The soft cut is now set to 3750 RPM and hard cut to 4000RPM.

1.10.3 Laptop Program

Run the software and enter the Launch Control tab. Program the rev-limits as desired.

1.10.4 Launch Procedure

Button Initiation – Stop the vehicle and press the launch button once leaving the adjuster selecting the desired percentage slip.

The car will then rev-limit between the programmed soft and hard cut limits. The rev-limit and launch control strategy depends upon whether wet or dry settings have been selected with the adjuster.

After 2-3 seconds the car should be settled on the Launch Control Rev Limit. If it is a turbo car the boost pressure should be gradually building up.

A common mistake is to bang the clutch in and instantly spin the wheels. The first 10 metres is the most critical phase, even a small amount of wheel spin at these low speeds is very high in percentage terms. The clutch should be slipped whilst not breaking traction, but not too much as to impede forward progress.

If you can't slip the clutch, then change it for one you can, you are losing out, here is why :-

The clutch can be used as torque converter. The torque curve on a race engine is going to be biased towards higher rpm, at low rpm there will not be a surplus of torque over wheel spin. Therefore the engine needs to rev before it can accelerate the vehicle at a decent rate. The clutch translates this high rpm into high torque.

On a low powered engine that cannot spin the wheels in first gear, the slipping clutch translates the stored momentum of the engine into torque to artificially boost the acceleration in the first few metres.

On a high-powered vehicle, the slipping clutch prevents the wheels from initially breaking traction, the most important factor in a good start.

If the car “bogs down” or has too much wheel spin adjust the rev-limits to program the perfect start.

1.11 Cars with only 3 wheel speed sensors

Some cars have a single sensor for the rear wheel speed that is mounted on the differential e.g. Nissan 200SX and some older Mercedes Benz. This means that the TC system cannot calibrate itself automatically. This can only be done via a laptop using the software.

1.11.1 Procedure for configuring cars with 3 wheel speed sensors

1) Locate the three sensor wires, (See 1.5.3 Connecting Traction Control ABS Wires).

2) Identify which signal wire is from the rear sensor.

This can be done using any of the following methods

- Wiring Diagrams - If you have a wiring diagram of the vehicle, trace each of the sensor wires to the ABS unit, the wiring diagram will normally indicate colour codes. If you have books such as the “Autodata - Anti Lock Braking Systems” series these can help in identifying the wiring. (Contact Racelogic if you do not have one).

- Multimeter – Select “Continuity Test” on the meter. Locate the rear sensor and place one probe on the signal wire at this point. Probe each of the three known sensor wires at the ABS controller until the meter gives an audible tone signifying the rear sensor signal wire.

- Supplied Software – Connect any 3 of the traction control wheel speed wires to the three known ABS signal wires on the car (Leaving one wire from the traction control disconnected). Run the software and open the graph window to enable you to monitor their function. Generally the front and rear sensors will be using a different number of reference points. Since the ‘pulses per revolution’ in the traction control unit for front and rear are set the same, the channel connected to the rear sensor when driving in a straight line will record a different speed. Using the information below you can identify which channel is associated with which traction control wheel speed wire and therefore which signal wire is from the rear sensor.

  Traction control wheel speed channel 1 = Red
  Traction control wheel speed channel 2 = Blue
  Traction control wheel speed channel 3 = Yellow
  Traction control wheel speed channel 4 = Green

  If the rear sensor does not use a different number of reference points, you can still locate which traction control channel is connected to it by turning a tight corner. In this situation the rear wheel speed will be the last to change state.

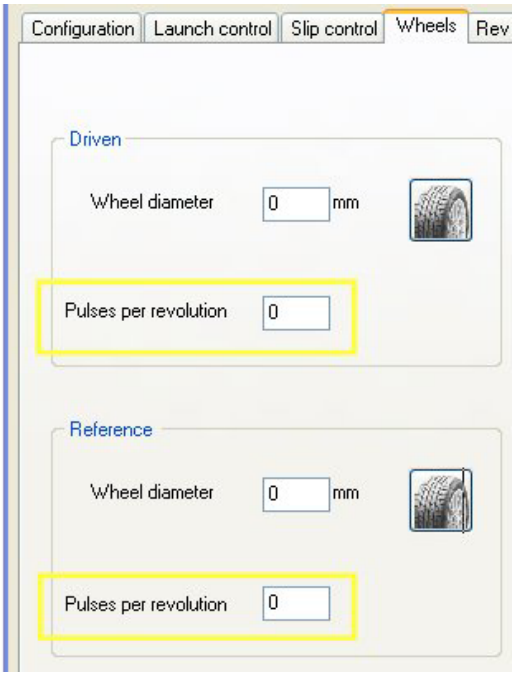
3) Connections

Connect the front wheel speed sensors to the traction control unit. Now connect the remaining two wires from the traction control unit to the rear wheel speed sensor wire.

Ensure you change the settings in the 'Wheels' tab to reflect the speed sensor connections.

4) Programming The PPR

Loading the traction control software and selecting the 'Wheels' tab will display the following information. See section 2.1 re software installation.



If the front and rear sensors are using a different number of reference points you will need to adjust the 'Pulses per revolution' (as shown above) to compensate. If it is not possible to count the pulses, adjust the values until the traction control is recording the same speed for both reference and driven wheels when the car is traveling in a straight line.

NOTE – When adjusting the PPR the traction control will need to be powered down for these changes to take place.

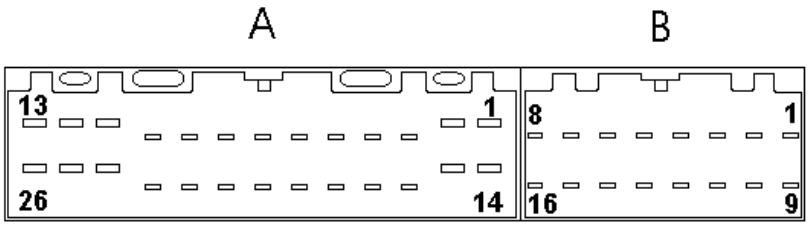
1.12 8 Cylinder Traction Control

The TC8 works in an identical way to all other system but has two extra injector channels.

The injector cut inputs and outputs wires have the following colours.

Traction Control Inputs and Outputs (4 Cylinder)			
Input Pin No	**Signal Input (Colour)**	**Output Pin No**	**Signal Output (Colour)**
A – 8	Red	A - 11	Red/Black
A – 9	Orange	A - 12	Orange/Black
A – 22	Grey	A - 25	Grey/Black
A – 23	Green	A - 24	Green/Black
Additional Inputs/Outputs (6 Cylinder and 8 Cylinder)			
A – 10	Yellow	A - 13	Yellow/Black
A – 21	Pink	A - 26	Pink/Black
B – 1	White/Red	B - 8	Green/Red
B – 2	Orange/Red	B - 9	Grey/Blue

1.13 Connector Wiring



Connector A

No	Description	Wire Colour
1	GND	Black
2	VIGN	Red
3	POT	Green
4	WSPA1	Red
5	WSPA2	Blue
6	WSPA3	Yellow
7	WSPA4	Green
8	I/P 1	Red
9	I/P 2	Orange
10	I/P 3	Yellow
11	O/P 1	Red/Black
12	O/P 2	Orange/Black
13	O/P 3	Yellow/Black
14	GND	Black
15	5V	Red
16	GND	Blue
17	ON/OFF	N/C
18	RPM	White/Black
19	GND	Yellow/Green
20	CSWITCH	
21	I/P 6	Pink
22	I/P 5	Grey
23	I/P 4	Green
24	O/P 4	Green/Black
25	O/P 5	Grey/Black
26	O/P 6	Pink/Black

Connector B

No	Description	Wire Colour
1	I/P 7	White/Red*
2	I/P 8	Orange/Red*
3	GND	
4	CONT1	
5	DIAG TX	Blue
6	DIAG RX	Red
7	GND	Green
8	O/P 7	Green/Red*
9	O/P 8	Grey/Blue*
10	GND	
11	CSWITCH	*
12	CONT3	
13	CONT2	
14	GSHIFT	Blue
15	12V	Red
16	12V	

- Only on TC8

2. Software

2.1 Installation

To install the traction control software, insert the CD into your CD-ROM drive. After a few seconds the “Install shield” prompt should appear. If the CD does not auto-run then browse the CD and double-click the 'SETUP' icon to start the install process. The install wizard will then guide you through the installation process.

2.2 Connecting the traction control to the computer

Connect a serial data cable from your computers COM port to the diagnostic lead of the traction control.

Start the software and from the options menu select the COM port which you have connected to the traction control via the serial lead.

Apply power to the traction control.

2.3 Transferring settings from the traction control

The supplied software allows you to adjust the settings which are stored within the traction control. To discover what values are set inside your traction control, select ‘Read data’ from the options menu. The software will now communicate with the traction control. If all is successful, a green bar will temporarily appear at the bottom of the screen. All the values read from the unit will now be displayed in the software.

If the software failed to communicate with the traction control, a red bar will temporarily appear at the bottom of the screen. Please check that you have selected the correct COM port from the options menu, the traction control is powered up and the serial lead still connected from your computer to your traction control unit.

Note: It is a good idea to save the values read from your traction control using the ‘save as’ option in the file menu in case you need to reset these values.

2.4 Transferring settings to the traction control

Once you have changed the settings in the software, you must write these values into your traction control.

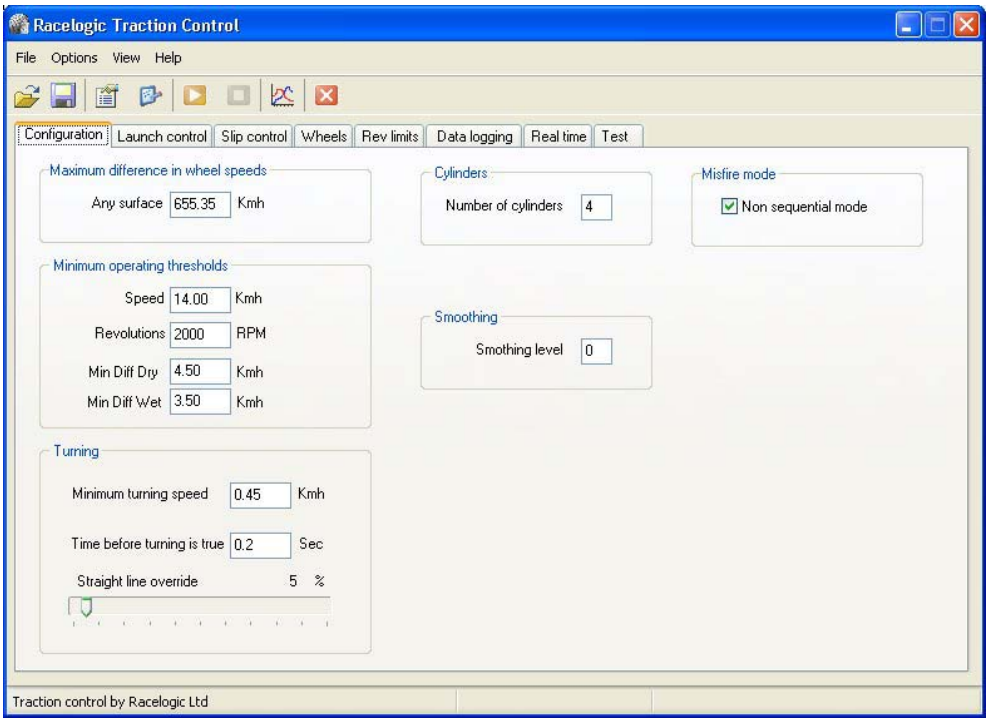
Ensure that ‘real time play’ is not enabled.

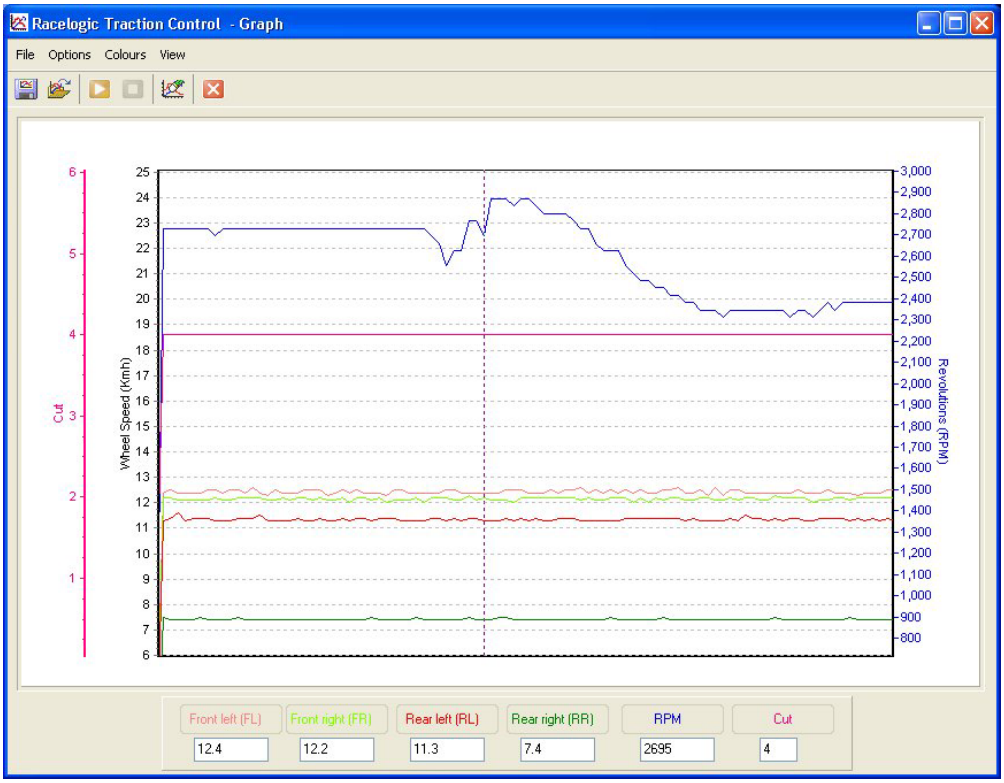
Select ‘Write data’ from the options menu. The software will now communicate with the traction control. If all is successful, a green bar will temporarily appear at the bottom of the screen. All the values are now written into the traction control unit.

If the software failed to communicate with the unit, a red bar will temporarily appear at the bottom of the screen. Please check that you have selected the correct COM port from the options menu, the traction control is powered up and the serial lead is connected from your computer to your traction control unit.

Note: You can always select restore defaults from the options menu to return the software to the Racelogic default settings. These can then be written to your traction control to reset the system.

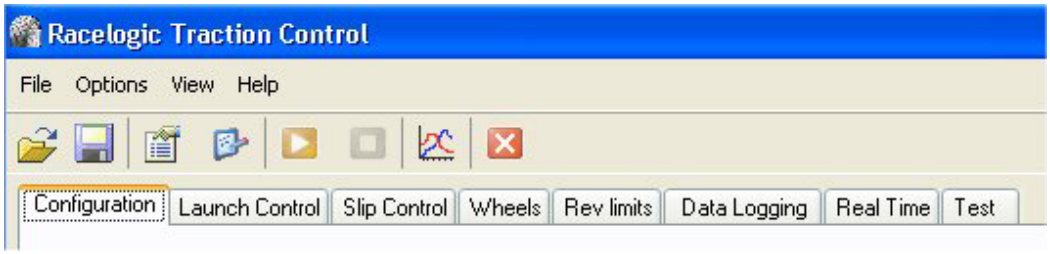
The screen shots below show the main and graph windows. To view the graph window, click on the view menu, then graph. The graph window will now appear.


Racelogic Traction Control
File Options View Help
Configuration Launch control Slip control Wheels Rev limits Data logging Real time Test
Maximum difference in wheel speeds
Any surface 655.35 Kmh
Cylinders
Number of cylinders 4
Misfire mode
Non sequential mode
Minimum operating thresholds
Speed 14.00 Kmh
Revolutions 2000 RPM
Min Diff Dry 4.50 Kmh
Min Diff Wet 3.50 Kmh
Smoothing
Smothing level 0
Turning
Minimum turning speed 0.45 Kmh
Time before turning is true 0.2 Sec
Straight line override 5 %
Traction control by Racelogic Ltd

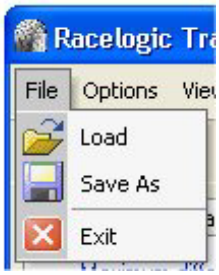


2.5 Main Window

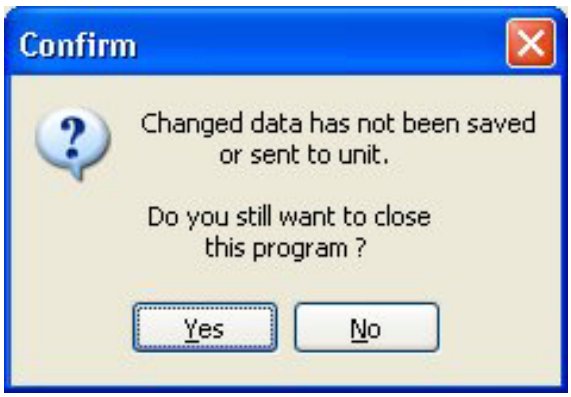
The software has a main menu bar with shortcut buttons shown below the menu. This menu is split into four sections as shown below.



2.5.1 File menu



'Load' allows you to load a file into the software containing previously saved settings.
'Save as' allows you to save all the current settings to a file.
'Exit' This will close the software. If you have made changes to any values and have not either saved the data to a file or sent the values to your traction control unit you will get the following message :



This is to prevent accidental closure of the software. If you are sure you want to close the software losing the modified data select 'Yes'.

2.5.2 Options Menu

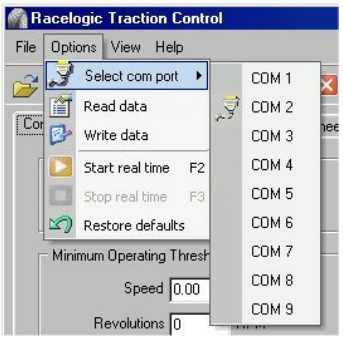
Select COM port

Each time you move the cursor to the 'Select COM port' option, the software detects which COM ports are available on your computer.

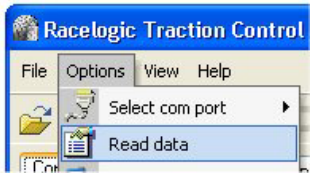
The above screenshot shows that 'COM 1' is greyed out which indicates that this COM port is present on the computer, but is presently being used by another program.

'COM 2' is available and is being used by this software.
'COM 9' is available and is not being used by any software.

When a computer is running windows 98, it is not possible to detect USB COM ports. Due to this, a list of COM1 to COM9 is shown. Note: Used COM ports will not be shown as used.



Read data



When 'Read Data' is selected, the software communicates with the traction control connected via the serial port lead and reads out all the traction control settings. These values are then displayed in the software.

Note: you cannot read from the unit whilst the 'real time' function is running.

Write Data

When 'Write data' is selected, all the settings shown in the software are written into the unit connected via the serial lead.

Note: you cannot read from the unit whilst the 'real time' function is running.

Real Time Play / Stop

Selecting 'Real Time play' enables live data to be read from the traction control. The 'Real Time play' button will be disabled and the 'Real Time Stop' button becomes available. Selecting 'Real Time Stop' will stop the unit transmitting data.

An indication that data is being read from the traction control is the flashing indicator in the top right corner of the screen.

The live data will be visible in the 'Real Time' tab and also the graph window.

You can also press the 'F2' key to start real time and 'F3' to stop real time without entering the menu.

Restore Defaults

Selecting ‘Restore defaults’ sets all the available options in the software to Racelogic default values.

2.5.3 View menu

Selecting ‘Graph’ will open up the graph window.
Selecting ‘Terminal’ will open up a window allowing direct communication with the traction control.

2.5.4 Help menu

Manual

Selecting ‘Manual’ or pressing the ‘F1’ key on the keyboard will open a window showing this manual.

About

Selecting ‘About’ will open a window showing version number of this software.

You can send an email to Racelogic by clicking on the blue email link.

There is also a link to the Racelogic website.

2.6 Graph Window

To view the graph window select ‘View’ then ‘Graph’ in the main window. To return to the main window select ‘View’ then ‘view main window’.

The graph window has a menu bar with shortcut buttons shown below the menu. This menu is split into four sections.

2.6.1 File menu

Save Graph data
This allows you to save the data currently shown on the graph.

Load Graph Data
This allows you to load in data previously saved and show it on the graph.

Print Graph
This allows you to print a copy of the graph.

Export
This allows you to export the graph data in the form of a picture (i.e. Jpg, Bitmap, Gif) or as data to allow you to load it into some other software i.e. Microsoft Excel.
Instead of saving to a disk, you can send the data via email by selecting ‘Send’.

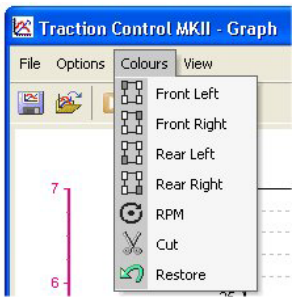
Exit
This will close the graph window and return you to the main window.

2.6.2 Options menu

Real Time Play / Stop
As main window

Erase Graph
This will remove all the data from the graph.

2.6.3 Colours menu



To change the colours used in the graph for each channel i.e. Front Left (FL). You can select the required colour from this menu. When you click on one of the items i.e. Rear Left, you will get the following window.

The colour that is currently set will be the default colour shown.

Restore
This allows you to reset the colours to the original colours set in the software.

2.6.4 View

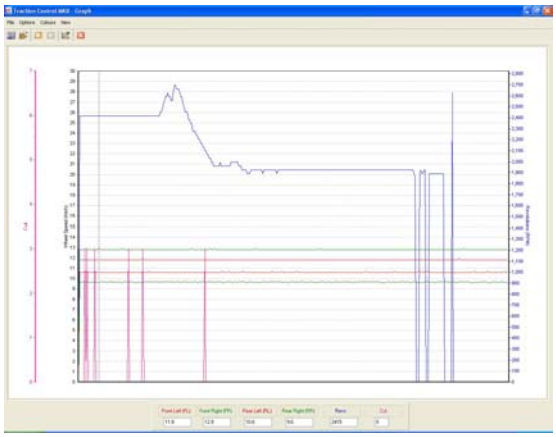
View Main Window
Selecting this will bring the main window in front of the graph window.

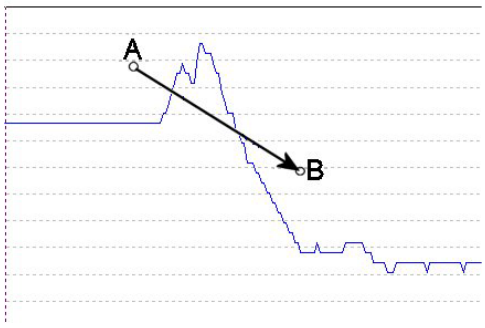
View full graph
This shows all the data in the graph window.

2.7 Graph Functions

2.7.1 Zoom

You can zoom into the graph to show an area in more detail.





To zoom, first place the mouse pointer at position ‘A’ then holding down the left mouse button drag the mouse down to point ‘B’. Then release the mouse button.

The graph window will now show a zoomed view of the area selected with the mouse.

To un-zoom you can select 'view full graph' from the 'view menu', or by holding the left mouse button down on the graph and moving UP to the LEFT (opposite to zoom in).

2.7.2 Pan

You can move the whole graph by holding the right mouse button and dragging the mouse around.

2.7.3 Cursor

When 'Real time' is stopped, the full graph is shown in the window. A dashed line will also appear on the screen, this is the cursor. Wherever this is on the graph, the value of each trace it crosses will be shown at the bottom of the screen.

If you click on the graph using the left mouse button, the cursor will jump to that point.

You can select the cursor with the mouse and drag the cursor across the graph.

Instead of using the mouse to move the cursor, you can use the left and right arrow keys on your keyboard. Holding down the shift key as well, will move the cursor in larger steps.

2.7.4 Show / Hide data

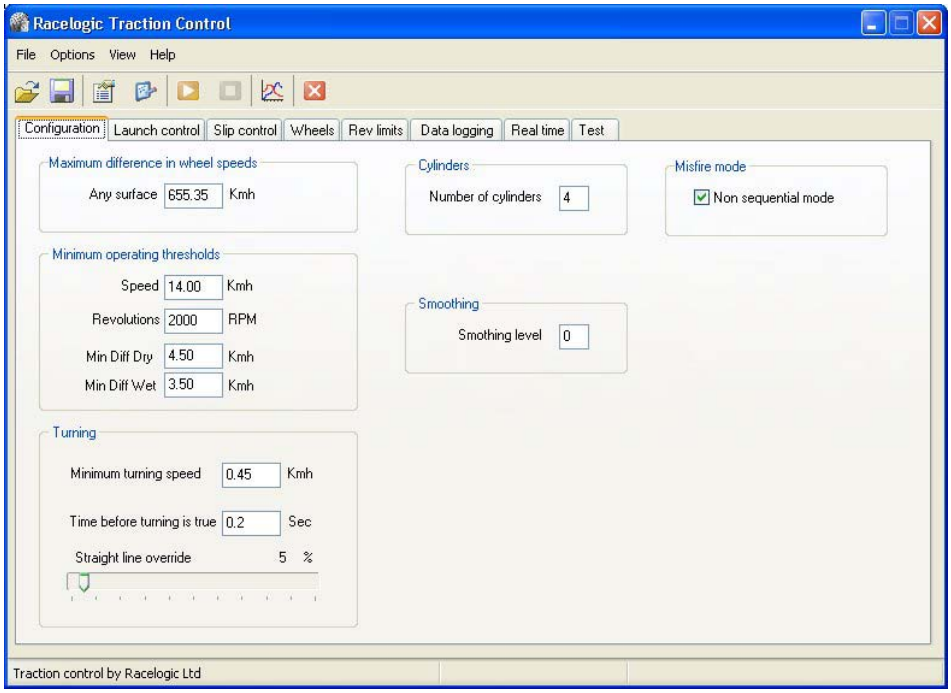
You can temporarily remove data from the graph by clicking on its title eg 'Front left (FL)' at the bottom of the screen.

This will remove the selected line from the graph. To show the data, just click again where the title was shown.

3. Traction Control Settings

To access the parameters stored in the traction control, select read from the options menu. The settings will then be displayed in the software.

3.1 Configuration


Racelogic Traction Control
File Options View Help
Configuration Launch control Slip control Wheels Rev limits Data logging Real time Test
Maximum difference in wheel speeds
Any surface 655.35 Kmh
Cylinders
Number of cylinders 4
Misfire mode
Non sequential mode
Minimum operating thresholds
Speed 14.00 Kmh
Revolutions 2000 RPM
Min Diff Dry 4.50 Kmh
Min Diff Wet 3.50 Kmh
Smoothing
Smothing level 0
Turning
Minimum turning speed 0.45 Kmh
Time before turning is true 0.2 Sec
Straight line override 5 %
Traction control by Racelogic Ltd

Maximum difference in wheel speeds
Glitch rejection allows unfeasible differences in wheel speeds to be rejected. Program this value to ignore differences that could not possibly be generated by driving the wheels. E.g. – If in a launch condition the maximum wheel spin generated is 50 Km/h, program the maximum difference to 70 Km/h, any spikes or glitches over this value will then be rejected.
Default value: 655.35 kmh

Minimum Operating Thresholds

Speed
This should be set to the minimum speed below which the sensors do not pick up any movement. This can be discovered by using the rela time function of the software. Slowly pull away and monitor the wheel speeds in the realtime tab screen and wait for all four wheel speeds to register.
e.g. – If all the wheel speeds are picking up correctly above 14 Km/h, program the Speed to 14.0 Kmh.
Default value: 14 kmh

Revolutions
The traction control system can be programmed not to operate below a certain engine Rpm. This is to stop the engine becoming 'bogged down'. If the car has a high revving 'cammy' engine, set this to the point at which the engine just starts to come on power.
Default value: 2000 RPM

Dry , Wet
This is set to allow a small difference in wheel speeds to enable turning sharp corners at low speeds. The system compares right front with right rear and left front with left rear. Adjust this value if the system cuts going round sharp corners when no wheel spin is occurring. Two values can be entered (WET and DRY) and can be switched using the manual adjuster to select wet or dry settings.
e.g. – Use the 'Real Time' function of the software to log data. Drive the vehicle and turn a sharp corner. Save the data from the graph window and examine the file. Look at the maximum difference between the wheel speeds (left front and left rear or right front and right rear) and enter this value.
Default value: Dry 4.5 kmh, Wet 3.5 kmh

Turning

Minimum turning speed
The system constantly compares wheel speed values. If it detects a difference in wheel speeds greater than the turning speed for a preset period of time (Time before turning is true) it assumes the vehicle is cornering and adds the value set in the straight line override to all the Percentage slip values.
Default value: 0.45 kmh

Time before turning is true
The period of time the wheel speeds must exceed the turning threshold before the system assumes the vehicle is cornering.
Default value: 0.2 Seconds

Straight-line override
The system has software that calculates when the car is cornering and when the car is traveling in a straight line. Generally more traction control needs to be applied when the car is cornering. This value adds a percentage to each of the percentage slips when the traction control knows the car is traveling in a straight line. E.g. – If the straight-line override is set to 5%, this value will be added to each of the percentage slip values when the car is traveling in a straight line.
Default value: 5 %

Cylinders
The traction control system must be configured to the correct number of cylinders of the engine.
e.g. For a 4 cylinder engine a value of 4 must be entered. If the incorrect Rpm is displayed under diagnostics, then change this value until the right Rpm is shown.
Default value: 4

Smoothing
Can be set from 0 - 5, level is normally set at 0 and should be increased depending upon the severity of the glitching. Level 5 should only be used for data logging.
Default value: 0

Misfire mode

The traction control has two modes of engine misfire that define how the data in the cut tables is used.

In non-sequential mode (Not spark cut units)

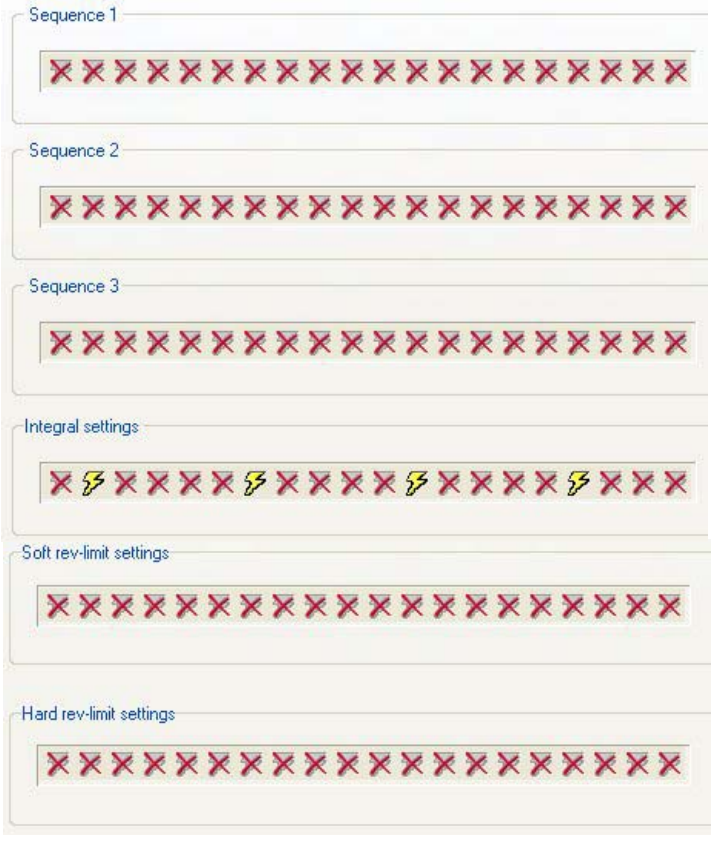
With the 'Non sequential mode' enabled each level of cut will cause the traction control to cut a pre-determined factory set number of injectors. Different numbers of injectors are cut depending upon the severity of the misfire applied. The specific of how the injectors are cut over a period of time is defined by the data in the corresponding cut tables.

'Sequence 1' will control injector 1.
'Sequence 2' will control injector's 1 and 2.
'Sequence 3' and 'Soft Cut' will control injector's 1,2 and 4.
'Hard Cut' and 'integral Cut' will control all injector's.

e.g. (using above Sequence 1)

	Injector 1	Injector 2	Injector 3	Injector 4
✕	Miss			
		Fire		
			Fire	
				Fire
⚡	Fire			
		Fire		
			Fire	
				Fire
✕	Miss			
		Fire		
			Fire	
				Fire
⚡	Fire			
		Fire		
			Fire	
				Fire
⚡	Fire			
		Fire		
			Fire	
				Fire
✕	Miss			

Suggested cut table settings when using non sequential mode.



The reason that most of the cut tables consist entirely of ✕, is because their severity is dictated by the number of injectors that are controlled.

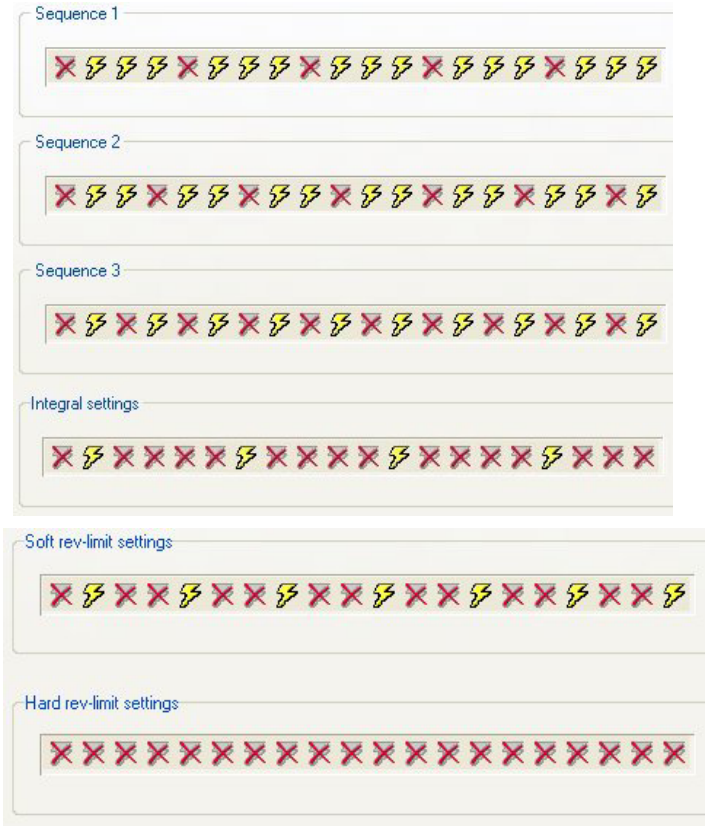
In sequential mode

With the 'Non sequential mode' turned off, the next firing injector or spark will be controlled by the cut sequence.

e.g. (using above Sequence 1)

	Injector 1	Injector 2	Injector 3	Injector 4
✕	Miss			
⚡		Fire		
✕			Miss	
⚡				Fire
⚡	Fire			
✕		Miss		
✕			Miss	
✕				Miss
⚡	Fire			
✕		Miss		

Suggested Cut Table settings when using sequential mode.

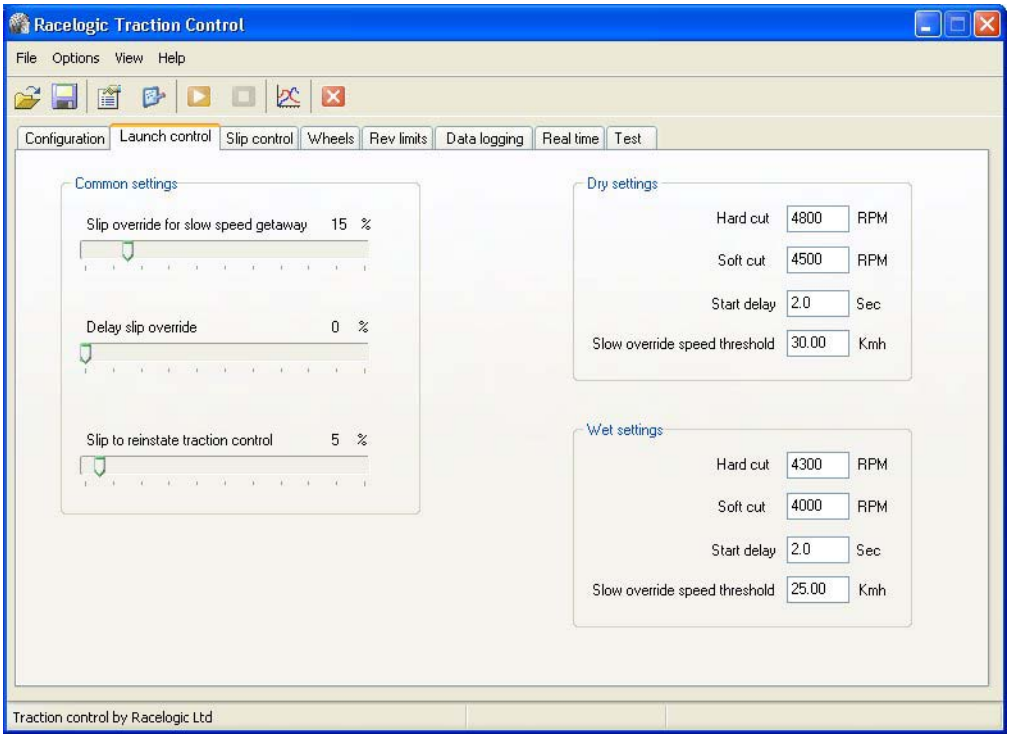


With this method the severity of the misfire is directly associated with the data in the cut table.

To ensure the system achieves the quickest possible response, always begin each cut table with a

NOTE: Sequential mode can only be activated if, the value in the 'cylinder' box in the configuration tab equals the exact number of cylinders the vehicle actually has.

3.2 Launch Control


Racelogic Traction Control
File Options View Help
Configuration Launch control Slip control Wheels Rev limits Data logging Real time Test
Common settings
Slip override for slow speed getaway 15 %
Delay slip override 0 %
Slip to reinstate traction control 5 %
Dry settings
Hard cut 4800 RPM
Soft cut 4500 RPM
Start delay 2.0 Sec
Slow override speed threshold 30.00 Kmh
Wet settings
Hard cut 4300 RPM
Soft cut 4000 RPM
Start delay 2.0 Sec
Slow override speed threshold 25.00 Kmh
Traction control by Racelogic Ltd

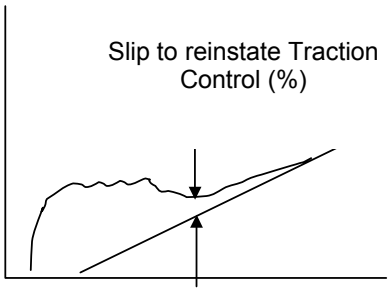
Common Settings

Slip override for slow speed getaway
An override percentage that is added to the overall percentage slip values during launch mode.
E.g. If Slow Override speed threshold is set to 3.5Kmh and the percentage slip override for slow speed getaway is set to 15%, then below 3.5 Kmh 15% is added to each of the slip values.
Default value: 15 %

Delay slip override
Delay Slip Override, used in conjunction with the start delay. The value adds a percentage override to the slip parameters for a set period of time programmed as the Start Delay.
Default value: 0 %

i.e. if 'Delay slip override' is set to 5% and 'Start delay' is set to 2 seconds, 5% will be added to each of the percentage slip values for 2 seconds during launch mode.

Slip to reinstate traction control
The slip threshold, at which the traction control will switch from Launch mode to normal Traction Control operation.



Default value: 5 %

DRY Settings , WET Settings

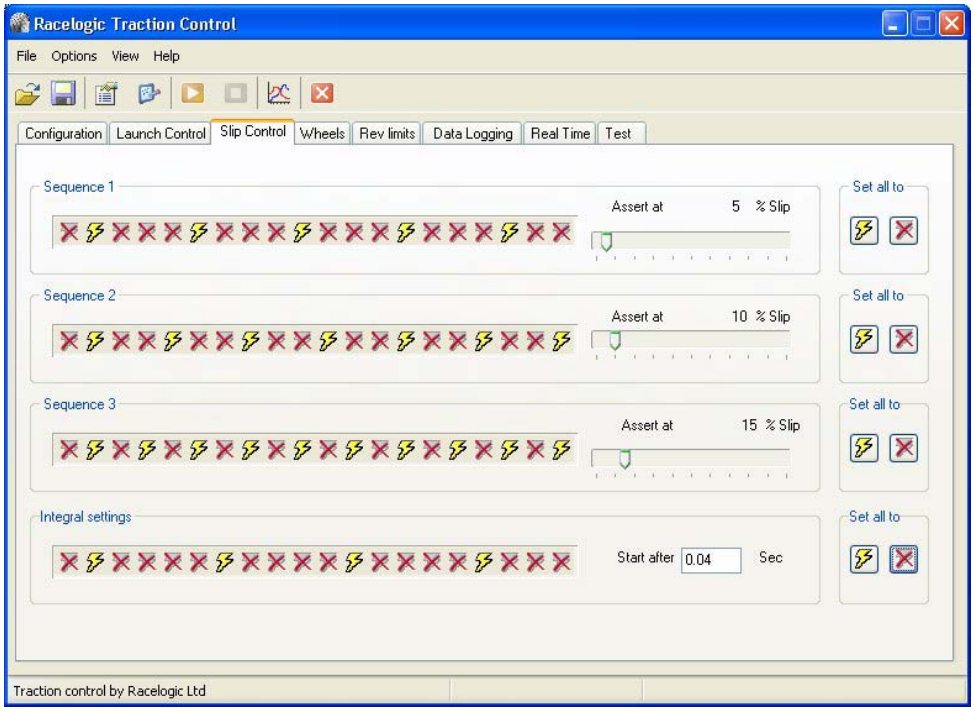
Hard Cut
Set the hard cut slightly above the soft cut to achieve a smooth rev-limit.
E.g. If the soft cut is at 4500 Rpm, set the hard cut at 4750 Rpm.
Two values can be entered under WET and DRY and can be switched using the manual adjuster to select wet or dry settings.
Default value: Dry 4800 RPM , Wet 4300 RPM

Soft Cut
Set the soft cut rev-limit to just below the desired Rpm. Two values can be entered under WET and DRY and can be switched using the manual adjuster to select wet or dry settings.
Default value: Dry 4500 RPM , Wet 4000 RPM

Start delay
The period of time at which the 'Delay slip override' percentage is added to the overall percentage slip values during launch.
Default value: Dry 2 seconds , Wet 2 seconds

Slow override speed threshold
This threshold works in conjunction with the 'Slip Override For Slow Speed Getaway'. Below this speed the Percentage Override setting is added to each of the percentage slip values.
Default value: Dry 30 kmh , Wet 25 kmh

3.3 Slip Control


Racelogic Traction Control
File Options View Help
Configuration Launch Control Slip Control Wheels Rev limits Data Logging Real Time Test
Sequence 1
Assert at 5 % Slip
Set all to
Sequence 2
Assert at 10 % Slip
Set all to
Sequence 3
Assert at 15 % Slip
Set all to
Integral settings
Start after 0.04 Sec
Set all to
Traction control by Racelogic Ltd

The severity of the misfires can be changed by modifying any of the cut tables.

Sequence 1,2 & 3

Placing a ⚡ will allow an injector to fire, putting a ✕ will prevent the injector from firing.

To quickly set all to either fire or non-fire, use the appropriate button in the 'Set all to'.

Assert at

When a manual adjuster is fitted, the level set i.e. 5% is known as the 'set allowable level'. If no adjuster is fitted, the 'set allowable level' is set to 0.

Assert at is the value at which the cut table is used above the 'set allowable level'.

e.g. Manual adjuster set to 10%
Sequence 1 'assert at' is set to 5%

The traction control will allow the wheels to have a maximum 10% of slip. Then at 15% slip (Manual adjuster + assert at) the traction control will start to reduce power using cut sequence 1 until it returns to a maximum of 10% slip.

To reduce power the traction control uses four levels of progressively intrusive cut. These are sequence 1,2,3 and Integral.

If the traction control is reducing power using sequence 1 and the slip reaches the value set for sequence 2, then the traction control will start to use sequence 2 instead of sequence 1.

Note: These same cuts are used for both wet and dry settings.
Default value: Sequence1 5%, Sequence2 10%, Sequence3 15%

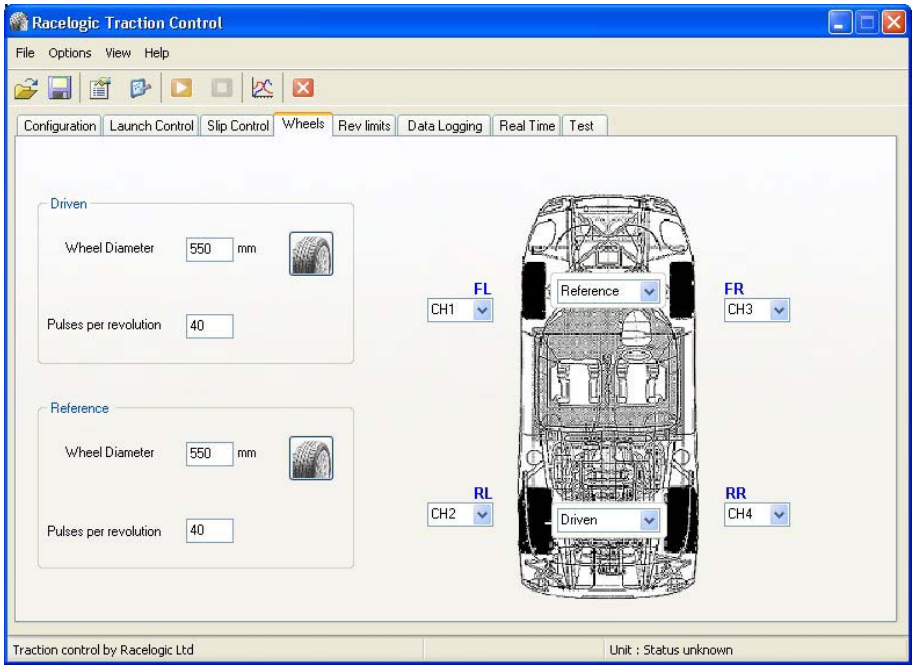
Integral settings

Placing a will allow an injector to fire, putting a will prevent the injector from firing.

Integral setting effect all of the cylinders even if the unit is set up for non-sequential mode.

Start After
If the wheels continue to slip despite the activation of sequence 3 cut then after a period of time defined by the 'Start after' value then the integral cut is applied.
Default value: 0.04 Seconds

3.4 Wheels

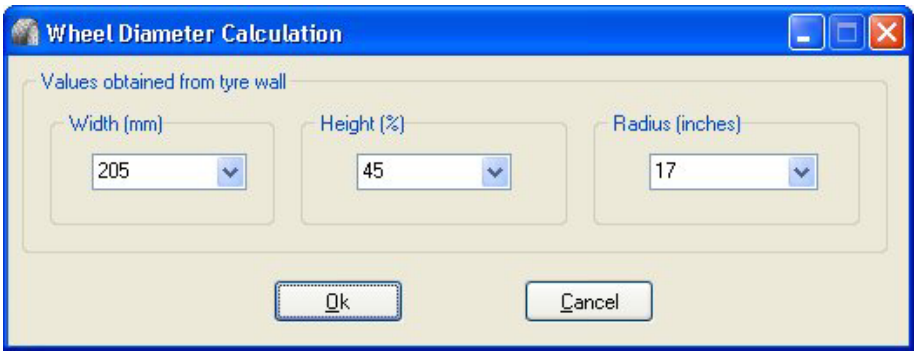


Driven / Reference

Wheel Diameter

The wheel diameters must be entered in millimeters, and must be the diameter of the tyre. This allows the system to calculate the rolling circumference.

Press the button and a window will appear.

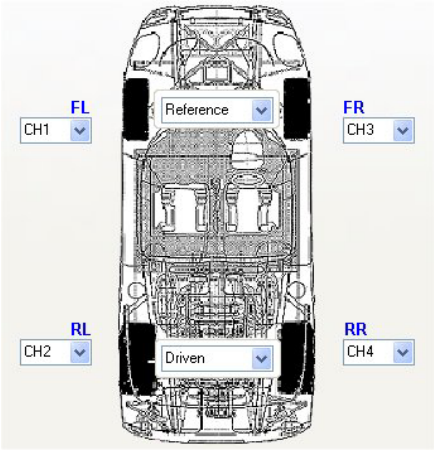


This lets you input the values as shown on the side of your tyre.

E.g. **205** / **45** *ZR* **17**

Default value: 550mm

Pulses per revolution
The number of reference pulses per revolution must be entered for the reference and driven wheels of the car, this value corresponds to the number of slots, holes or teeth per revolution in each of the sensor discs.
Default value: 40

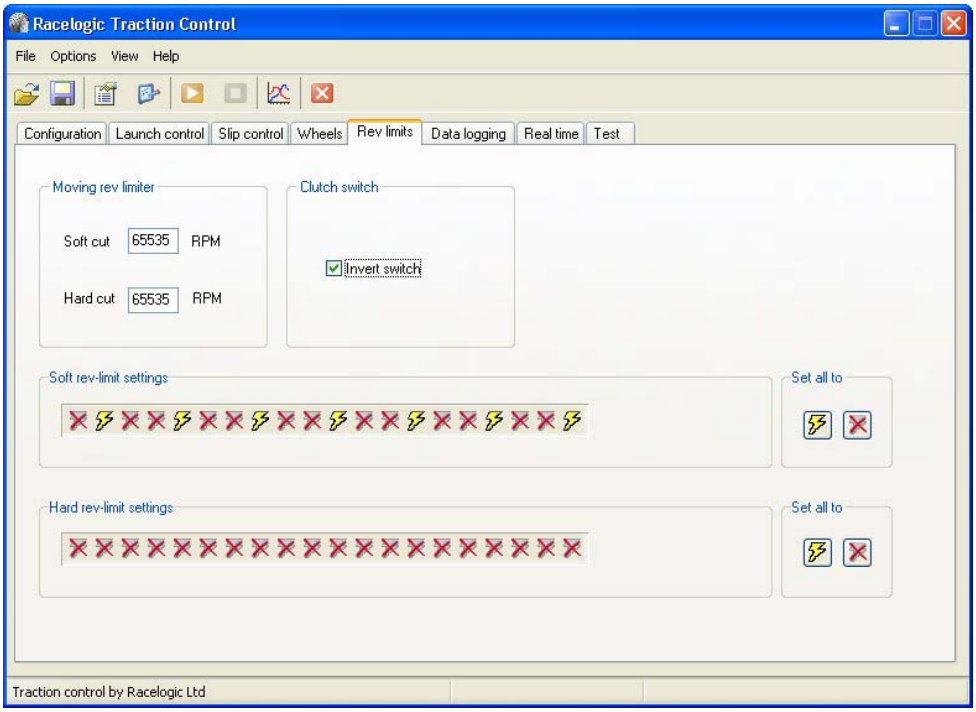


Reference / Driven
The system is fully configurable to allow any wheel speed to represent any wheel. This makes life easier when wiring up the system. The box must be informed of which traction control wheel speed channel is connected to which wheel. On a rear wheel drive car, set front channels to ‘Reference’ and rear channels to ‘Driven’. On a front wheel drive car, set the front channels to ‘Driven’ and the rear channels to 'Reference'.

Wheel Assignment (FL ,FR ,RL ,RR)
In a similar way to reference/driven wheel assignment the left and the right wheels must be setup.

Note :
The channels corresponding to front and rear, can be assessed by using the ‘Real time’ function, and spinning each separate wheel in turn.

3.5 Rev limits


Racelogic Traction Control
File Options View Help
Configuration Launch control Slip control Wheels Rev limits Data logging Real time Test
Moving rev limiter
Soft cut 65535 RPM
Hard cut 65535 RPM
Clutch switch
Invert switch
Soft rev-limit settings
Set all to
Hard rev-limit settings
Set all to
Traction control by Racelogic Ltd

Moving rev limiter

Soft cut / Hard cut

Similar to the rev limits used for the Launch Control Function except these are operated whilst the car is moving. Again, the soft cut is operated at, say 5500 RPM and the hard cut is operated at a higher engine speed, say 5750 RPM. These rev limits are used for the Power Shift function. It is activated by the clutch switch, and allows full throttle gearshifts to be carried out whilst the engine is prevented from over-revving.

Default value: Soft cut 65535 RPM , Hard cut 65535 RPM.
Note: a value of 65535 will set this function to OFF.

Clutch switch

The polarity of the clutch switch is normally open, which is closed when the clutch pedal is depressed. If a normally closed switch is used, i.e. one that breaks connection when the clutch is depressed, tick the box.

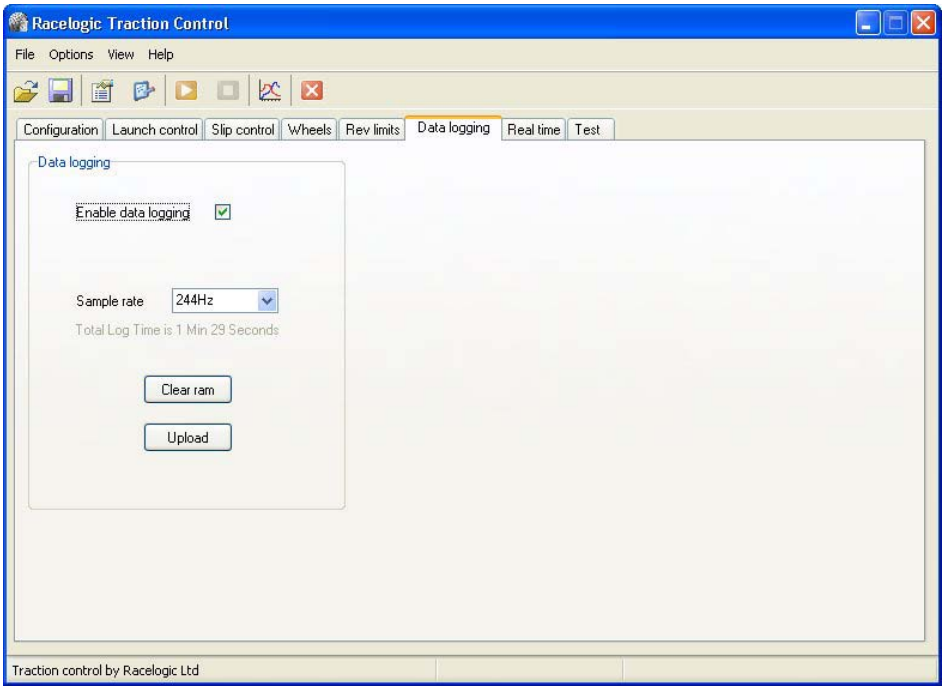
Default value: enabled

Soft / Hard rev-limit settings

Placing a will allow an injector to fire, putting a will prevent the injector from firing.

To quickly set all to either fire or non-fire use the appropriate icon in the ‘Set all to’.

3.6 Data Logging (Only for units with battery backup memory)


Racelogic Traction Control
File Options View Help
Configuration Launch control Slip control Wheels Rev limits Data logging Real time Test
Data logging
Enable data logging
Sample rate 244Hz
Total Log Time is 1 Min 29 Seconds
Clear ram
Upload
Traction control by Racelogic Ltd

The Data Logging feature allows you to record all wheel speeds and traction control activity over the period of time the traction control was active. The system will retain all information even if the box is switched off, but once the system has been switched off, the next lot of data will gradually overwrite the previous, so only the most recent run is recorded.

Enable Data Logging
Switch-able function, that allows data logging to be used.
Note: Data logging must be turned off for the diagnostic functions to work.
Default value: off

Sample Rate
The sample rate is a compromise between the resolution of the results versus the length of time available for logging. That means you could select '244Hz' for the sample rate, which will give around 244 samples every second, but will only allow 1.5 minutes of sampling. It is best to use a quicker sample rate when data-logging standing starts, and a slower one when logging over the period of a race.
Default value: 244 Hz

Sample Rate (Hz)	Total log time
244	1 Minute 29 Seconds
122	2 Minute 58 Seconds
81	4 Minute 28 Seconds
61	5 Minute 57 Seconds
49	7 Minute 27 Seconds
41	8 Minute 56 Seconds
35	10 Minutes 26 Seconds
22	16 Minutes 24 Seconds
15	23 Minutes 51 Seconds
12	31 Minutes 19 Seconds
9	38 Minutes 46 Seconds
8	46 Minutes 13 Seconds
7	53 Minutes 41 Seconds
6	61 Minutes 8 Seconds
5	68 Minutes 36 Seconds

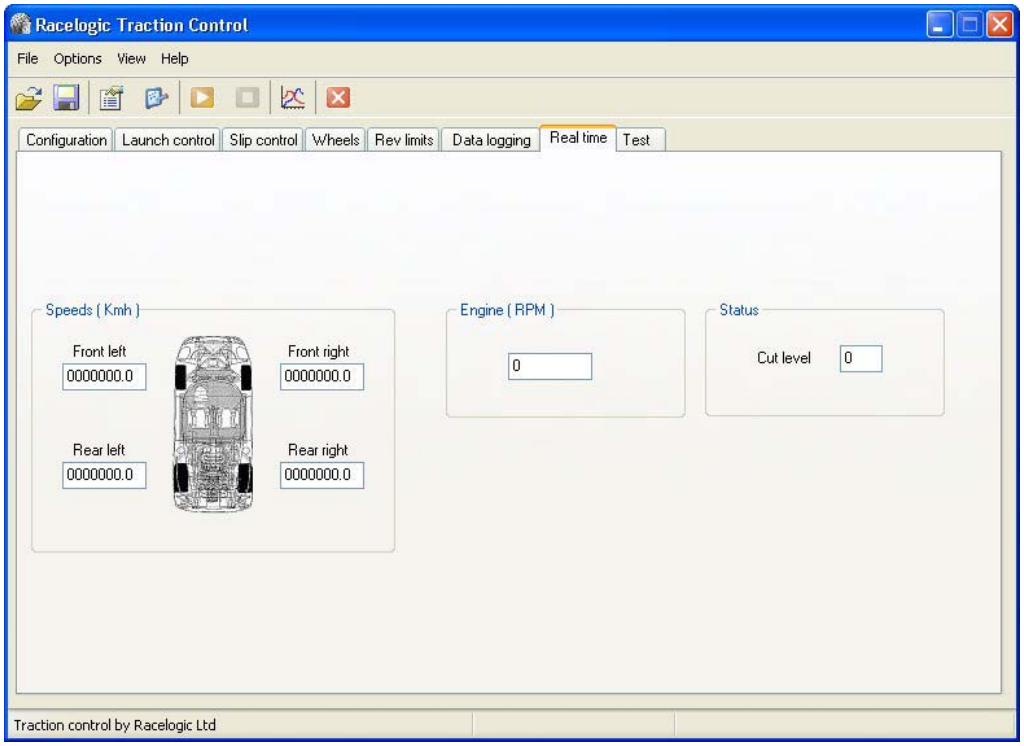
Clear Ram

Click on this button to clear the ram of any previous data. Alternatively the clear ram switch can be pressed when the system is powered up.

Upload

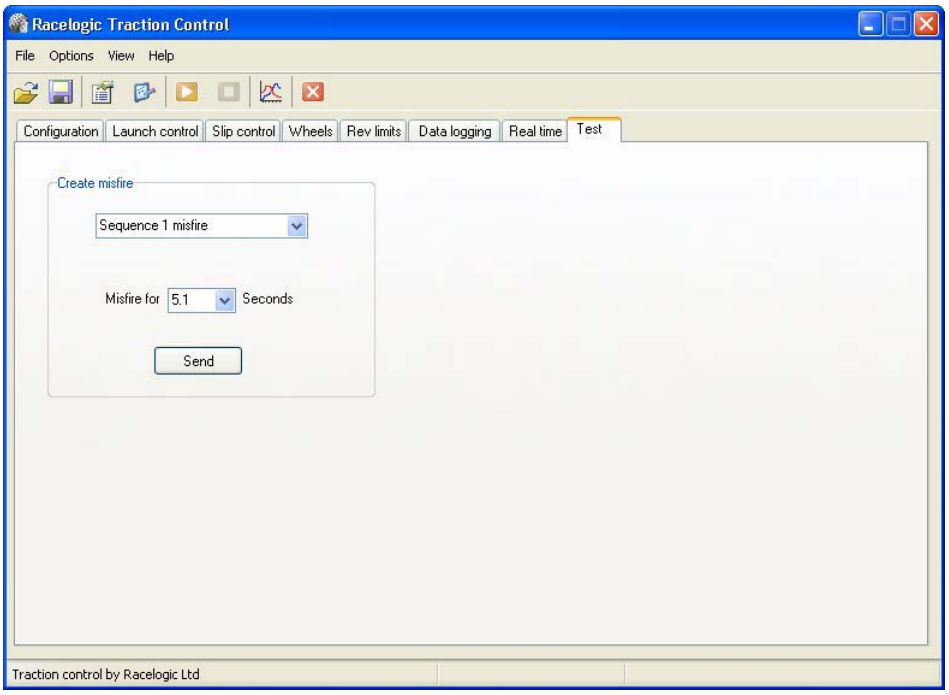
Click on this button to upload the data from the unit. The data will be visible in the graph window.

3.7 Real time



If ‘Real time’ has been started, the values from the traction unit will be displayed on this screen. The values shown are the four-wheel speeds in Kmh, Engine RPM, and cut level status.

3.8 Test


Racelogic Traction Control
File Options View Help
Configuration Launch control Slip control Wheels Rev limits Data logging Real time Test
Create misfire
Sequence 1 misfire
Misfire for 5.1 Seconds
Send
Traction control by Racelogic Ltd

This allows you to apply one of the cut sequences from the traction control to the engine.

The cut will last for the length of time set in ‘Misfire for’.

Note: You cannot send a test command whilst the ‘real time’ function is running.

4. FINE TUNING

This section gives a few pointers to common problems associated with the traction control set up.

The following section requires the use of a laptop computer.

Q - The traction control reduces engine power before it gets a chance to produce full power.

A – The Minimum RPM before operation (Configuration tab, Minimum operating thresholds, Revolutions) can be raised. This is set to 2000 as standard. If the car is a high revving car it may need raising to where the car comes on cam.

Q - The car appears to cut on cornering when no wheel spin is being produced.

A - Using the real time function in the software check that wheel spin is definitely not being produced. If it is not raise the Minimum difference by 1-2 Km/h. This should allow the car to turn a tighter corner without the traction control cutting in.

Q - On all settings of the adjuster the car feels like it is being held back all the time.

A - Increase the Percentage slip values (Slip control tab).

Q - The car still over steers .

A - Reduce the Percentage Slip values (Slip control tab), and reduce Minimum difference (Configuration tab) by 0.5-1.5Km/h.

Q - The Car bogs down on Launch Control.

A - Increase the Launch control rev-limits (Rev limits, Moving rev limiter).

Q - The Car produces lots of wheel spin on Launch Control.

A - Reduce the Launch control rev-limits (Launch control tab, Dry/Wet settings).

Q - The car appears to bog down pulling out from tight junctions.

A - Raise the ‘Slow override speed threshold’ and ‘slip override for slow speed getaway’ (Launch control tab).

Q - The ABS sensors do not pick up until 18Km/h and is causing the traction control to misfire the car in first gear.

A - Raise the Minimum speed threshold to above 18Km/h. (Configuration tab, Minimum operating thresholds, speed).

Q - The traction control reduces the power enough on corners but in a straight line the car still wheel spins.

A - Lower the Straight-line override, this will reduce the slip allowed in a straight line. (Configuration, Turning).

Q - The car has different size wheels front to rear, which means the speed of the wheels is different.

A - Measure the diameter of the front and rear wheels and type in the Wheel diameter - Driven, Wheel diameter - Reference. (Wheels tab).

Q - In the software the speed of the wheels is different to the speedometer.

A - The pick-up points that the ABS sensors are picking up from are different to the value in the traction control. By working out the difference in speed to what is in the software, adjust the Number of pulses per rev – Driven and Number of pulses per rev – Reference until they are the same. e.g Peugeot 306 Rallye 24 PPR. (Wheels tab).

Q - The RPM value in the software is different to what is showing on the Rev counter.

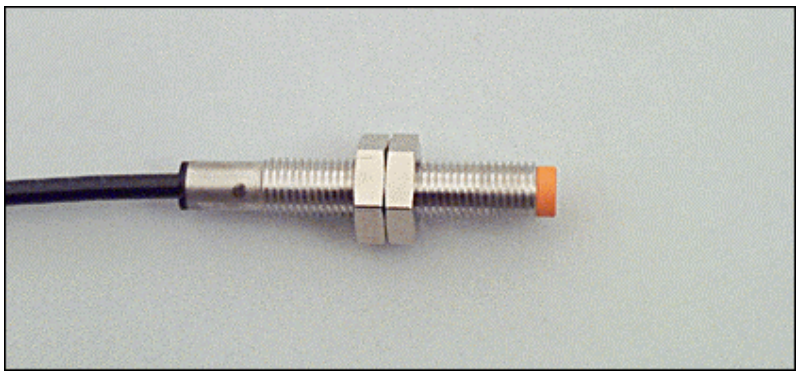
A - The Number of cylinders value is incorrect. Adjust the value until both values are the same. (Configuration tab, Cylinders).

Q - Which is the best setting for dry weather?

A - The best setting for dry weather is down to the driving style of the driver. The adjustable system allows the driver to choose a setting which suits them best. We would suggest 10% slip as this has proved to give the best acceleration in tests, which is position 3 on the adjuster.

5. SELF-FIT SENSORS

5.1 Sensor



5.2 Pickup Methods

The exact method used to locate and trigger the wheel speed sensors is absolutely critical to the correct operation of the Traction Control System. There are a number of different ways to construct the pick-ups, the slotted disc method, the toothed wheel, hole detection and bolt detection.

Sensor's must be rigidly mounted so no large vibrations occur that will move the sensor head more than 0.5mm away from the reference points and the head must be at 90° to the surface. If a sensing plate / disc is used, it must not be warped or mounted at an angle that would cause the distance between the head and disc to change by more than ±0.5mm. The material used for the reference must be of a ***ferrous*** type, if in doubt, check to see if it attracts a magnet. The reference can be painted or plated.
To achieve the best results, the sensor should be at least 40mm away from the center of rotation of the reference. The number of reference holes / teeth / slots should be between 4 & 120, there can be a difference from front to rear as this can be programmed in at a later stage.

Slotted disc - (See diagram 12a for construction)

Toothed wheel - The teeth have to be clean without any scratches in the metal that would cause false signals at high revolutions. The minimum size of teeth is 2mm across. (See diagram 12b for construction)

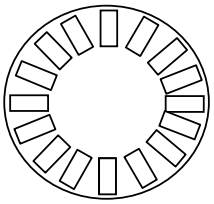
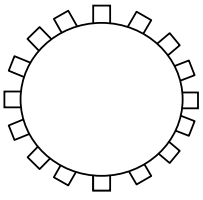


Diagram 12a - Slotted Disk



12b - Toothed Wheel

Hole detection - The reference holes have to be bigger than the head of the sensor, bigger ones are preferable.

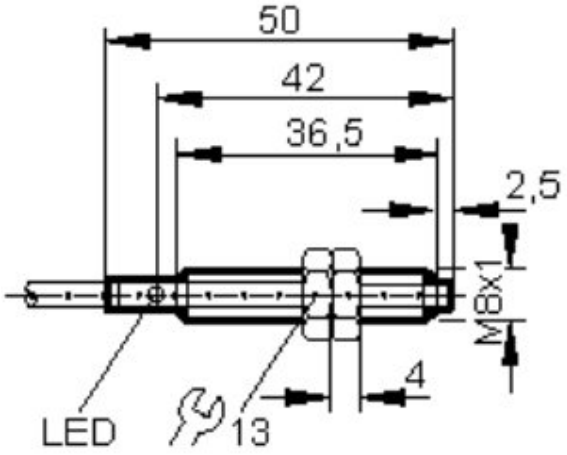
Other - If none of the methods above are practical, then it is worth noting that the sensor can pick up from evenly spaced fixing bolts, or cooling vanes in a brake disc etc.

It is recommended that the sensors are shielded from any stray stones thrown from the wheels and kept well away from any other source of electrical noise (HT leads, radio leads, coil power supply leads etc.).

Racelogic have fitted numerous cars and have found that the best method of fitment is to pick up from the back of the wheel fixing bolts.

5.3 Sensor Fitting

The sensor is mounted by the two nuts that are supplied with the sensor. When tightening the sensor, care has to be taken as the sensor can be split in half or cross-threaded if over tightened. It is recommended that a thread lock be used to stop the nuts becoming loose.



5.4 Sensor Gapping

The sensor will work up to a range of 2mm. Try to gap the sensor to 1.5mm away from the pickup point, this will allow for any movement.

Power up the traction control System and keep moving the sensor closer until the LED on the sensor is illuminated.

NOTE – If you are picking up from a wheel hub etc, it is very important that the gap on the sensor does not move when the car is under hard cornering. This could cause the gap to either close up or open up. This could cause the sensor to drop out and the traction control to stop working correctly.

5.5 Sensor Checklist

- LED on the sensor **must** be illuminated.
- Sensor face must be at **90°** to the surface.
- Over one revolution, the sensor to plate distance must not vary more than **±0.5mm**.

5.6 Running Wheel speed Wires

It is very important that the wires marked with each corner of the vehicle are connected to the sensors in those corners. The system will not work if this is done incorrectly.

The system is programmed at the factory to reflect these settings. Orientation will be as the driver sits in the vehicle. See Diagram 13.

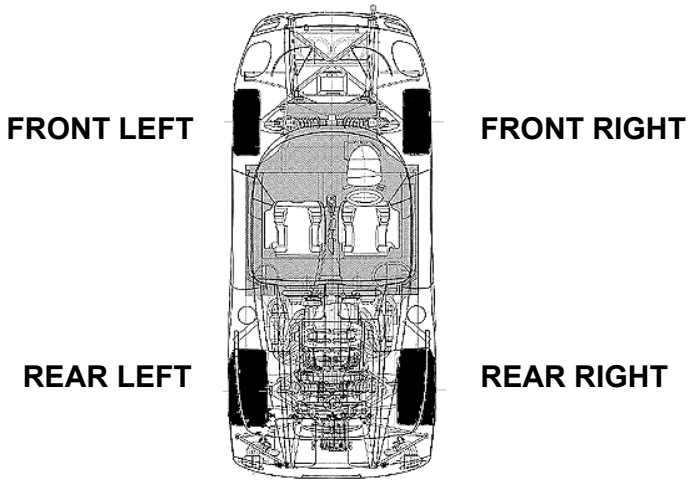


Diagram 13 - Wheel speed Orientation

5.7 Connecting Sensors

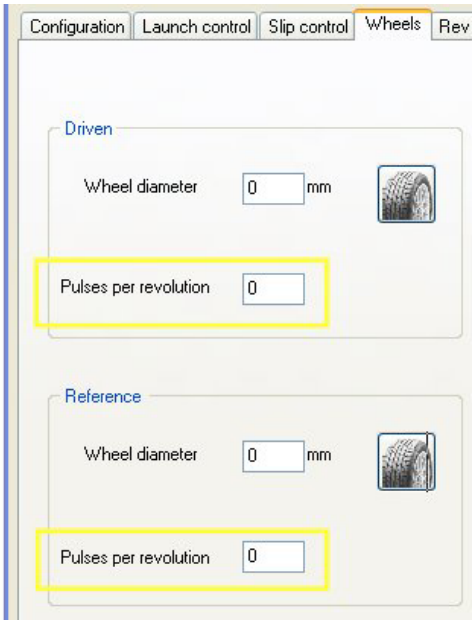
Once the sensors have been fitted each of the four wires must be run to the sensors. Each wire has two cores with red and blue shielding. Connect each wire to the sensor as follows.

- Run each wire to the sensors.
- Place a length of Heat shrink over the wire.
- Strip back the insulation exposing the two cores.
- On the red wire crimp the female contact, and on the blue wire crimp the male.
- Push the crimps into the Sure Seal (waterproof rubber connector that comes with the sensors), red to pin 1 and blue to pin 2, ensuring they are pushed all the way in.
- With a heat gun shrink down the heat shrink.

Sure-Seal Pin	TC Colour	Sensor Colour
1	Red	White
2	Blue (GND)	Black

5.8 Programming the PPR (pulses per revolution)

The traction control will need to be programmed for the amount of pick up points that are being used.



Once these have been changed and downloaded to the unit, the system will need to be powered down for the box to register the changes.

5.9 Testing

Once all the sensors have been mounted and connected, the traction control can be powered up. Each wheel in turn can be spun and the LED on the sensor should flash at each pick up point.

The car will now need to be tested by driving the vehicle. The best way to do this is by using the real time function of the software that has been supplied with the traction control.

The above screen shows that two of the sensors are being picked up earlier than the other two. This is due to the rear having more pick up points than the front. This is not a problem unless the two sensors that pick up later are not registering before 14km/h.

When the sensors are working correctly, they should look like the screenshot below, with all of the wheel speeds overlaying each other. Note - when the car turns the wheel speeds will all be different, the vertical line shows this.

The screen shot below shows a sensor dropping out. This could be due to the sensor not being close enough, not at 90 degrees to the pick up point or the sensor not being mounted securely.

5.10 Common Sensor Problems and Solutions

Q – The LED on the sensor will not flash.

A- Check that the traction control is powered up.
A - Check the sensor has been wired up correctly.
A - Check that the pick-ups are ferrous.

Q – The Car misfires when driving.

A - Check that all sensors are all working using the real time function of the software..
A - Check that the sensors are coming in before 14km/h. If not adjust the minimum speed.

Q – The car works in a straight line, but under hard cornering the system misfires.

A - Use the software to see if the car is misfiring due to wheel spin or sensors dropping out.

Q – The Sensor drops out when using the software.

A - The sensor is too far away, move the sensor closer.
A- The sensor is not mounted rigidly.

6. CLUTCH SWITCH

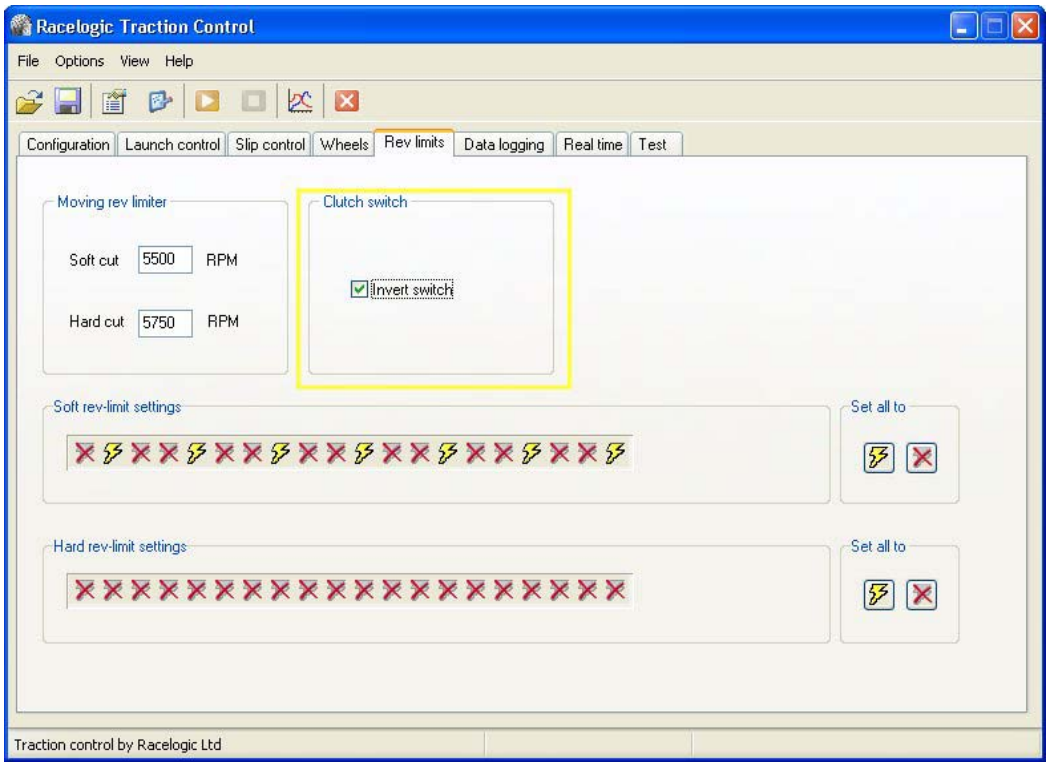
The clutch switch allows the driver to make gear changes without having to back off the accelerator. This allows for faster gear changes and quicker acceleration times. Tests have shown up to 0.1 seconds can be gained per gear change.

6.1 Fitting a switch

The switch needs to be mounted on the clutch pedal, in a place where the contact makes or breaks when the clutch is depressed. A suitable switch is a motorcycle rear brake switch, this is a plunger type switch that can be adjusted to switch at the biting point of the clutch. Rear brake light switches can also be used. These have not proved as successful on road cars as by just resting your foot on the clutch pedal is enough to switch the rev limit on. Another method that can be used is a hydraulic switch, these are easier to install on race cars.

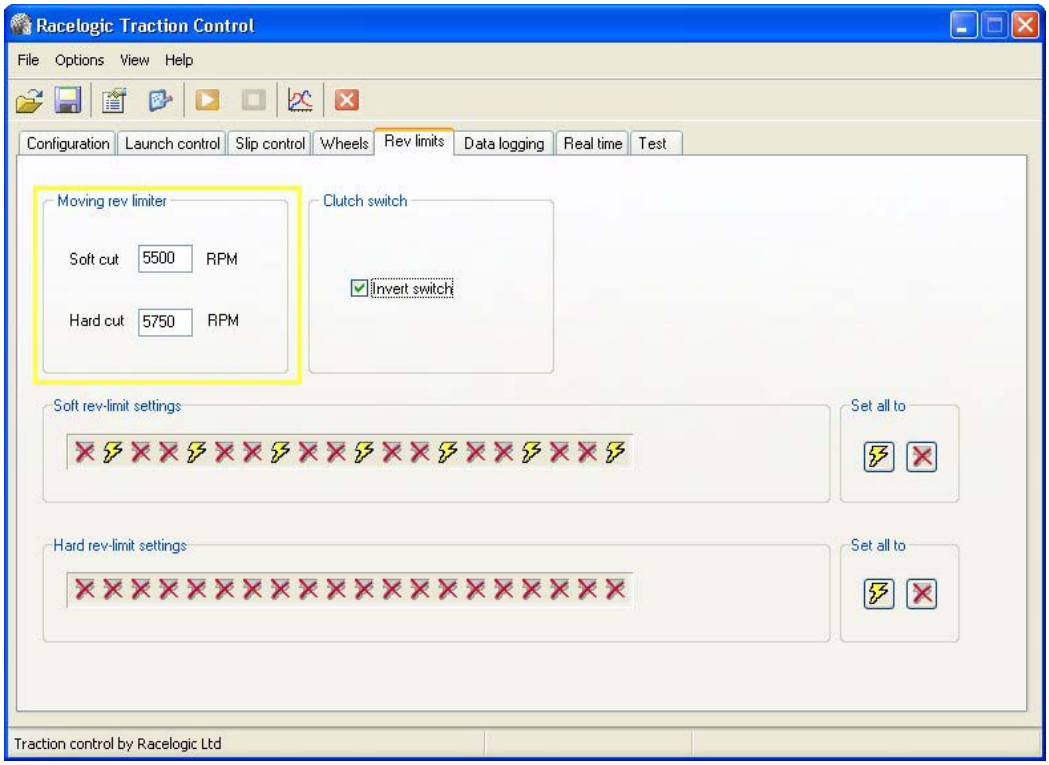
The chosen switch is wired up by connecting one side of the switch to GND and the other to pin 20 on the traction control loom.

The traction control is set up for a normally open contacts, this can easily be adjusted in the software by changing the following in the launch control menu.



6.2 Setting the Clutch Switch REV Limits

These rev limits are similar to the rev limits used for the launch control function except they are operated whilst the car is moving. The difference between the soft and hard cut is set to 250 Rpm.


Racelogic Traction Control
File Options View Help
Configuration Launch control Slip control Wheels Rev limits Data logging Real time Test
Moving rev limiter
Soft cut 5500 RPM
Hard cut 5750 RPM
Clutch switch
Invert switch
Soft rev-limit settings
Set all to
Hard rev-limit settings
Set all to
Traction control by Racelogic Ltd

The rev limits will need to be set 1000-500 Rpm lower than the cars own rev limit. The full throttle shift should be smooth, so adjust the rev limits to get the smoothest change.

6.3 Testing the Clutch Switch

The easiest way to test the switch is to drive the car on a quiet road. While still rolling place the car into neutral, press the clutch and raise the revs up to the new rev-limit. By placing the accelerator hard down the car will settle on the new rev-limit, until the clutch is released.

7. MSD Interface

Racelogic multiple spark discharge (MSD) traction control works with the crank signal feeding the MSD unit. Usually there will be two wires from the crank sensor to the MSD unit, one will be connected to GND and the other will carry the crank signal, See Diagram 14.

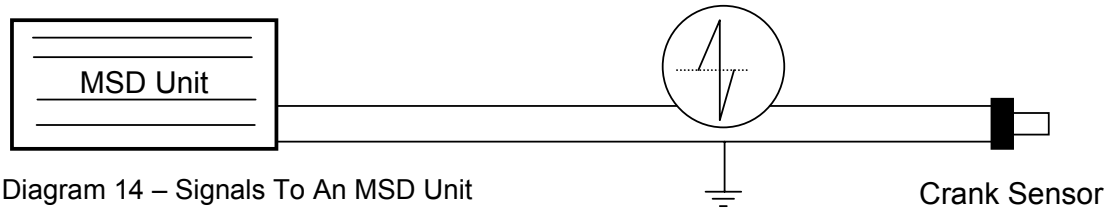


Diagram 14 – Signals To An MSD Unit

7.1 Connecting the MSD Cut

The signal wire feeding the MSD unit should be cut and the Traction Control Ignition cut interface should be connected as in Diagram 15.

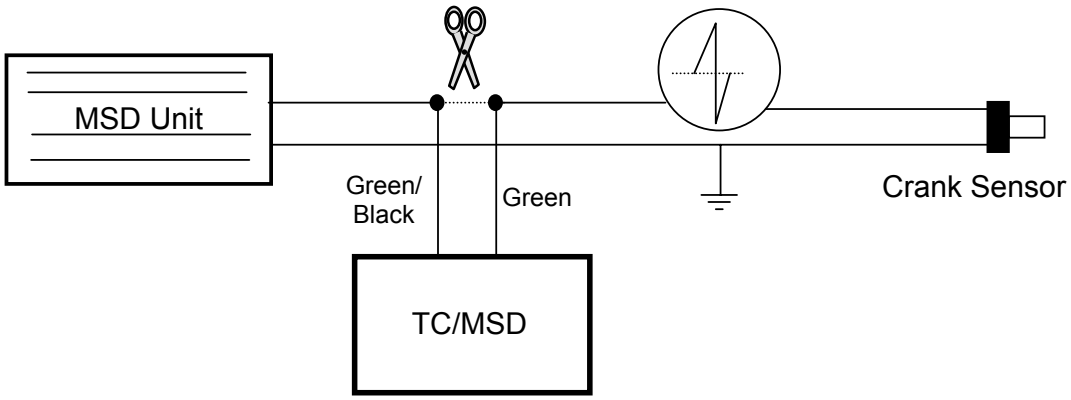


Diagram 15 – Traction control MSD unit

Traction control Pin Number	Traction control Colour	Crank Colour
12	Green	
13	Green/Black	

We highly recommend that the traction control should be interfaced with the car using connectors so that the car can easily be returned to run as standard. This can be done using a 'bullet' type connector.

- Cut the signal wire on the crank sensor at a convenient position.
- Remake the connection with connectors.
- Connect the appropriate connector to the traction control wiring to connect the traction control.

7.2 RPM

The RPM signal will be taken from inside the MSD, so no extra connections will need to be made.

NOTE - The cylinders value in the traction control may need to adjusted to get the correct value.

8. Spark cut

8.1 General

The spark cut traction control unit, works by monitoring the signal used by the coil too generate a spark. If traction control is required this signal is interrupted so that individual firing pulses are selectively missed out resulting in a reduction of engine power.

8.2 Connecting the spark cut

Locate the negative side of the coil(s). Generally a coil will have two terminals, a positive which will show a constant +12V and a negative which carries the signal that the coil will amplify.

The traction control has two coil interface wires (pins 12 and 13). For a single coil application join both these wires together and attach to the negative side of the coil. For a twin coil application use both wires separately.

For spark cut sequential mode must be selected (Configuration tab).

8.3 RPM

No external RPM signal is required.

Note: the cylinder value in the traction control may need to be adjusted to get the correct RPM reading.